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ANNUAL REPORT

OF THE

# Department of Agriculture

OF THE

PROVINCE OF ONTARIO

1906

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VOL II.

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TORONTO:

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ANNUAL REPORT  
OF THE  
Bureau of Industries  
FOR THE  
Province of Ontario  
1906

PART I.—AGRICULTURAL STATISTICS.  
PART II.—CHATTEL MORTGAGES.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:  
Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty.  
1907.



WARWICK BRO'S & RUTTER, LIMITED, PRINTERS  
TORONTO.

TO THE HONOURABLE

WILLIAM MORTIMER CLARK, K.C.,

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

The undersigned begs to present herewith for the consideration of Your Honour the Report of The Ontario Bureau of Industries for 1906.

Respectfully submitted,

NELSON MONTEITH,

*Minister of Agriculture.*

TORONTO, 1907.





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# Ontario Bureau of Industries.

## PART I.—AGRICULTURAL STATISTICS.

### THE WEATHER.

Under their respective headings, summary tables of temperature, precipitation, and sunshine are herewith presented:

**TEMPERATURE.** The following table gives the temperature of the Province in each month for the last ten years, together with the mean annual temperature: also the mean temperature for the six months April–September—practically the growing season—together with the average for the twenty-five years 1882–1906:

Month.	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1882–1906
January.....	26.6	13.6	10.8	18.5	18.7	19.0	21.9	18.7	20.2	19.5	17.3
February.....	18.4	12.7	8.8	21.8	18.1	13.0	17.1	15.2	22.0	21.8	17.5
March.....	23.4	27.2	26.2	37.4	35.0	26.9	20.5	25.8	35.6	29.0	26.3
April.....	43.3	41.1	37.5	43.3	43.6	45.0	44.8	44.5	42.1	42.7	41.7
May.....	53.5	52.7	56.1	56.8	53.2	54.6	54.6	55.7	55.5	52.9	53.9
June.....	65.0	62.8	63.3	60.8	59.2	65.8	64.1	64.8	65.6	60.9	63.9
July.....	68.2	68.7	66.2	67.3	68.6	71.9	68.2	67.5	70.2	71.9	67.9
August.....	70.0	66.1	63.3	62.4	63.5	67.5	70.9	68.5	67.7	64.2	65.7
September.....	63.3	60.9	57.2	59.0	59.0	60.1	62.3	56.2	61.8	60.8	58.9
October.....	47.6	47.5	45.0	49.2	46.3	48.5	55.2	50.0	48.7	50.1	46.8
November.....	35.0	33.7	33.6	32.3	41.0	31.9	35.3	38.0	34.9	34.9	34.9
December.....	19.9	27.0	17.6	17.7	20.9	22.7	24.7	25.1	22.8	24.6	23.5
Annual mean...	44.5	42.8	40.5	43.9	43.9	43.9	45.0	44.2	45.6	44.4	43.3
Mean for six months, April to September }	60.5	58.7	57.3	58.3	57.9	60.8	60.8	59.5	60.5	58.9	58.7

The mean temperature of the year 1906 was 44.5 degrees, being 1.7 degrees above that of the preceding year, and 1.3 degrees above the mean temperature for the twenty-five years. The average temperature for the six months April–September was also higher than usual. March, May, and December were the only months which failed to equal the average of their respective temperatures for the twenty-five years period. January, for a winter month, and August, for a summer month, had abnormally high mean temperatures.



**SUNSHINE.** In the following table the averages of sunshine are, as usual, derived from the records of the weather stations at Woodstock, Toronto, Lindsay, Kingston and Ottawa :

Months.	Sun above hori- zon.	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1882- 1904
	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
January.....	285.7	88.6	80.6	71.0	54.4	84.1	59.7	77.1	90.8	76.2	70.4	75.2
February....	291.4	135.4	116.1	109.0	90.9	127.7	115.7	109.8	112.8	69.3	93.7	103.3
March.....	369.9	133.0	157.7	109.2	99.8	138.8	96.9	161.4	133.2	157.5	148.3	144.4
April.....	406.4	201.6	169.8	124.6	184.7	144.1	154.5	214.0	223.2	230.2	174.2	188.3
May.....	461.1	218.6	206.5	211.4	284.1	207.8	177.3	247.9	210.9	196.3	196.9	217.5
June.....	465.7	228.8	210.4	228.9	196.0	199.3	365.5	305.3	278.2	237.1	212.8	242.0
July.....	470.9	270.3	236.8	237.3	261.2	241.5	268.2	266.3	302.2	207.8	258.7	264.5
August.....	434.5	255.7	261.6	256.6	180.6	245.2	206.0	271.4	262.1	225.2	262.4	242.2
September..	376.3	237.7	194.6	172.8	203.7	149.3	199.7	190.0	164.4	202.4	237.1	189.4
October.....	340.2	125.7	151.8	124.4	152.4	119.1	163.0	164.0	141.7	118.2	261.0	138.7
November...	286.9	84.2	95.9	100.1	114.0	76.6	80.3	82.4	78.6	89.0	60.8	78.5
December...	274.3	65.6	63.8	60.9	59.5	71.0	62.9	46.6	60.2	56.6	40.6	60.5
Total for the year	4463.3	2045.2	1945.6	1806.2	1881.3	1799.5	1852.7	2136.2	2058.3	1965.9	1923.9	1944.6
Total for 6 months, April-Sept	2614.9	1412.7	1279.7	1231.6	1310.3	1187.2	1274.2	1494.9	1411.0	1399.0	1349.1	1344.0

The year 1906 had 2,045.2 hours of sunshine, or fully one hundred hours more than the average for the last twenty-five years. More than two-thirds of this increase must be credited to the six growing months, April-September. March, June and October, however, each averaged less hours of sunshine than usual.

**PRECIPITATION.** The fall of both rain and snow for the five winter months' including November, 1905, and March, 1906, is given in the following table for ten years, together with the average for the twenty-five years, 1882-1906. An inch of water is the equivalent of ten inches of snow :

Year.	November.		December.		January.		February.		March.		Total for five months.	
	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.	Rain.	Snow.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1906.....	1.96	6.0	1.22	8.8	1.34	10.2	0.46	8.1	1.13	11.6	6.11	43.7
1905.....	0.33	4.3	0.55	14.6	0.22	23.2	0.06	20.5	0.98	3.6	2.14	66.2
1904.....	0.98	7.2	0.71	24.1	0.48	24.9	1.04	14.7	1.78	9.4	4.39	80.3
1903.....	1.60	4.0	1.06	14.6	0.78	19.8	1.31	13.6	1.92	1.7	6.67	53.7
1902.....	1.25	8.0	1.85	14.2	0.10	20.4	0.56	12.1	2.34	2.5	6.10	57.2
1901.....	2.99	10.4	0.51	8.6	0.58	18.8	R	17.6	1.60	13.1	5.68	68.5
1900.....	1.13	1.0	2.15	14.5	0.72	15.8	1.68	26.8	0.53	18.8	6.21	76.9
1899.....	1.67	9.6	0.74	24.6	1.50	13.2	0.76	8.0	1.78	22.1	6.45	77.5
1898.....	3.40	8.9	1.73	17.5	1.47	18.2	0.60	18.9	2.42	1.0	9.62	64.5
1897.....	2.51	6.2	5.37	9.6	1.15	17.3	0.89	14.1	1.52	12.7	6.44	59.9
1882-1906..	1.98	8.0	1.26	15.0	0.94	20.1	0.87	16.1	1.20	10.7	6.25	69.9

The total amount of rainfall during November-March was 6.11 inches, which was about normal, while the total snowfall was only 43.7 inches, or 26.2 inches less than the average for the five months. The figures for the three months December-February show that the snowfall in that period was only about half of the average, while March had nearly an inch more of snow than usual.

The six months, April-September, however, comprise what is regarded as the growing season for most crops, and the following table gives the rainfall of these months for the last ten years, and also the average for the twenty-five years, 1882-1906:

Months.	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	1882-1906
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
April. ....	1.41	1.04	2.22	2.32	2.12	2.26	1.44	1.10	1.45	2.52	1.26	1.61
May. ....	2.34	3.32	3.36	1.82	2.44	3.67	2.03	3.43	2.43	3.38	2.10	2.83
June. ....	4.52	3.53	3.20	3.83	3.92	2.14	2.83	2.46	2.83	2.83	2.39	2.98
July. ....	2.93	3.55	3.50	4.09	5.49	3.90	3.96	2.78	1.11	5.36	2.79	2.94
August. ....	2.57	3.26	3.76	3.77	2.02	2.78	2.15	0.81	2.64	2.62	2.86	2.63
September. .	2.41	2.42	3.24	2.21	3.53	2.78	2.73	3.72	2.94	0.83	4.47	2.65
Total for 6 months	16.18	17.12	19.28	18.04	19.52	17.53	15.14	14.30	13.40	17.54	15.87	15.64

During these six growing months the rainfall was 16.18 inches, which was a little above the average for the same period for the twenty-five years. There is little out of the ordinary to note in the table, the most interesting fact being that there was relatively less rainfall than usual during April and May, when most of the spring seeding is done.

### VEGETATION.

When correspondents wrote about the middle of May, field and forest growth was considered to be fully a week behind. Warmer weather was then prevailing, and it was pointed out by some correspondents that the backward state of the season had the redeeming feature of giving much assurance of freedom from spring frosts.

**SPRING SEEDING.** Except in the more eastern counties along the St. Lawrence seeding was well advanced, and in many cases completed, by the middle of May. The seed-bed was as a rule in excellent condition, and although growth has been slow, the general opinion was expressed that the "catch" would turn out to be first-class. The acreage of spring grains is estimated to be fully up to the average, with an enlarged area of oats and peas. In the Essex district an increased acreage of tobacco is also expected.

### THE GRAIN CROPS.

**FALL WHEAT.** The Crop Bulletin issued in November, 1905, contained the following: "The area of new fall wheat is larger than that of last year, taking the Province over, although a few counties may show a decrease. Sowing ranged from the last week in August to the first week in October, but the bulk of the crop was got in between the 8th and 19th of September. The ground was in good condition at seeding, and timely rains gave the crop a splendid



start. The appearance of the young wheat when correspondents reported about the beginning of November was most favorable, although fears were expressed by some that there had been a somewhat too vigorous growth, giving the crop rather too much head. Scattering reports were made of the presence of the Hessian fly, white grub and wire-worm, but not to a serious extent. Dawson's Golden Chaff is still the most popular fall wheat sown, but some correspondents complain of this variety as having a tendency to smut."

The remarkably open weather, affording little or no covering of snow most of the time, and changes of temperature varying from extremely mild conditions to intense cold, led growers of fall wheat to fear the outcome. The cold, dry, and generally backward spring was also unfavorable to the crop. However, the general situation in the third week in May was characterized as being better than was expected, although reports varied greatly in describing the condition of the fields. Some accounts were enthusiastic over the promising state of the crops, while others from the same district spoke of failures more or less marked. High lands did well compared with flat or low-lying places; rich, sharp, and well-drained soils also prospered. Fields sown early did much better than those got in later, and wheat sown on sod was markedly ahead of that grown on stubble land. The bulletin went on to say: "A considerable area at scattered points will be plowed up and resown to other crops, but in many cases barley will be drilled into the "patchy" spots. The presence of the wire-worm was pointed out by a number of correspondents, but no serious injury was reported from that or other insects. The most favorable reports, relatively, regarding fall wheat come from Lake Erie and Lake Ontario counties."

According to returns made in August, the unusually open winter was most trying to fall wheat, but the crop picked up wonderfully in the spring, and improved steadily until cutting. It was harvested under favorable conditions, the straw standing up well, and the weather being dry and bright. The quality of the grain, as a rule, was plump and well up to weight, and the yield per acre was considerably over the average. Very little rust was reported, and only occasional mention was made of injury from insects. Cutting ranged from the 10th to the 28th of July, according to locality.

The favorable reports at harvesting of both the yield and quality of fall wheat have been borne out in the threshing. Several correspondents in November reported the grain as running well over standard weight. But slight mention was then made of injury to the crop by insects or rust.

**THE NEW FALL WHEAT.** The November bulletin contained the following regarding the fall wheat then in the ground: "The splendid yield of fall wheat this year, and the almost entire disappearance of the Hessian fly, have encouraged farmers to sow a slightly extended acreage of wheat this fall. The crop was got in as early as August 25th, and sowing continued as late as October 10th, the bulk being got in in the first half of September. The seed bed, as a rule, was rather dry and lumpy for a good catch, but timely rains helped the crop to pick up, and most correspondents report the young wheat as looking healthy and ready for the winter. Very little mention was made of the Hessian fly or wire-worm."

**SPRING WHEAT.** This variety of wheat is not much in favor, more especially in the western part of the Province. Harvesting was in progress as correspondent wrote, about the beginning of August, and a good yield was promised, although some of the crop had been "lodged" by rain storms. Several correspondents stated that "Wild Goose" was the only variety of spring wheat now grown.

In referring to fall wheat, the November bulletin said : "The crop was up to the mark in yield, but while much of it is described as good in quality, some shrunken grain is also reported. Spring wheat appears to be steadily going out of favor as an Ontario crop."

**BARLEY.** A large yield of plump grain, much of it discolored, but all of it good for feeding live stock (which is now its chief use in Ontario), was the record of the barley crop of 1906, according to the August crop bulletin. As with the other spring grains, there was considerable "lodging," but taken as a whole, the crop was then regarded as a success.

November reports concerning barley were to the effect that the crop, like fall wheat, was one of the best in years. Although much of the grain was discolored, its plumpness rendered it first-class for feeding purposes. The straw was long, and some "lodging" was reported.

**OATS.** The August bulletin said : "This crop suffered more than any other from rain storms, and much of it was so badly lodged as to render cutting very difficult. Grasshoppers also attacked oats in different localities, more especially in the Lake Erie counties, and the crop suffered slightly from rust and wireworms. Notwithstanding these drawbacks, there will be a comparatively large yield per acre, and the crop may be classed among the more successful ones."

Later reports, sent in about the beginning of November, stated that the cutting of oats was a difficult matter owing to so much of the crop being lodged by rain storms. There was a good yield of both grain and straw. Reports varied as to the quality of the grain, the weight running from light to heavy. Grasshoppers also attacked the crop, but very little injury from rust or smut was complained of. Even with all the drawbacks against it the crop was above an average one.

**PEAS.** For the last five or six years the depredations of the pea weevil (commonly called the "bug") were so great that in nearly every section of the Province the acreage given to peas shrank to alarmingly small proportions. Last year, however, the weevil gave but little trouble to pea growers, and this season the pest is usually mentioned only to remark its absence. Some correspondents, writing early in August, spoke of mildew and of injury from rain in low-lying places, and complaint was also made by some that the intense heat at podding time prevented the peas from fully developing ; but the general tone of the reports was most hopeful, and the pea crop was then regarded as one of the best for years. Correspondents also predicted a larger acreage for next year.

Reports in November regarding peas differed considerably. Taken all together, however, the crop was regarded as an improvement in quality compared with more recent years. The presence of the dreaded weevil or "bug" was reported only at scattered points, and the growing of peas was said to be coming again into general favor.

**BEANS.** The growing of beans as a field crop is confined chiefly to Kent and adjoining counties. The crop was not fully matured as correspondents wrote about the beginning of August, but gave promise of more than an average yield per acre. The raising of beans for selling in a green state to canning factories is on the increase.

**RYE.** Only a small acreage of rye is now grown in Ontario for the grain. Most of it is fed green, and in some cases it is cut for hay. The crop was regarded early in August as a comparatively light one. November reports had but little to say regarding rye, but the quality was described as being from fair to good.



**BUCKWHEAT.** This crop is now raised in Ontario by comparatively few farmers, and even then only in small acreages, but where grown it has done very well this season.

**CORN.** The August bulletin contained the following regarding this crop : "As a Simcoe county correspondent has tersely put it, 'This has been a corn summer.' All things point to a large yield, both for husking and the silo, as the crop is reported to be earing remarkably well. Some complaints have been made of cut-worms or grubs attacking the young corn early in the season, more especially where planted on sod, and rain injured the crop on low lands; but, taking the Province as a whole, corn responded to the warm weather which has prevailed since June, and made a splendid growth. The crop is considered to be well forward, and unless frosts are unusually early all classes of corn ought to mature in perfect condition."

"This has turned out to be a remarkably fine crop both as to yield and quality," said the November bulletin. "The plant had most favorable growing weather all along, was well cobbled and fully matured, and for both husking and silo purposes was all that could be desired. Only a little of the latest was caught by frost."

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### HAY AND CLOVER.

May reports regarding clover were to the following effect: "Like fall wheat, clover suffered from lack of protection of snow during the winter, and much of the crop was heaved, resulting in considerable loss. Low-lying spots were also badly winter-killed, and some had to be plowed up. Old fields showed most injury, the young clover coming through in remarkably good form. Notwithstanding the many complaints of poor fields, there are nearly as many favourable accounts of a splendid showing. In fact, the two winter crops of clover and fall wheat never have called forth more varied reports as to prospects, correspondents in the same locality widely differing as to the condition of both."

The August bulletin had the following to say of hay and clover: "Owing to the lack of snow last winter, pastures were much exposed, and considerable winter-killing resulted, old fields suffering most. Timothy came through much better than clover, and made a much better growth relatively during the summer. The yield per acre is below the record of recent years, although making a fair show compared with the average for the last twenty-four years. The hay crop has been generally well saved, however, and its excellent feeding quality is favourably commented upon by a number of correspondents. Hardly any mention was made of the midge. Alsike is reported as yielding well."

**CLOVER SEED.** Winter-killing and midsummer drouth told on clover fields reserved for seed, and the crop was rather a light one. When correspondents wrote, under date of November 1st, but little of the crop had been threshed owing to the rush of other farm work. While not at all general, the midge was at work in various localities, both east and west. Alsike, however, had turned out well where reported upon.

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### FIELD ROOTS.

**POTATOES.** The August bulletin said: "Much difference of opinion is expressed regarding the present condition and the probable yield of potatoes. While there will be some good yields in every section of the Province, the presence of the blight will tend to keep down the average. The Colorado beetle was out in force, as usual, but while Paris green is used by every farmer against this pest, only a few of the more progressive men spray with Bordeaux mixture

for the blight. A few correspondents speak of rot, but no general complaint has been made."

The following was the statement concerning potatoes in the November bulletin: "Reports concerning potatoes are varied. While a number of correspondents speak of rot, others call attention to its absence this season. The bulk of the returns are to the effect that the crop will not give an average yield, and the tubers will be rather small in size, but of good quality. A blight of the vines before maturity occurred in some sections, and a 'white grub' was complained of by several correspondents in some of the West Midland counties. However, with less rot reported than in recent years, the outlook for potatoes is on the whole comparatively favorable. All the crop was stored as correspondents wrote."

**CARROTS.** Correspondents reporting upon roots have but little to say about carrots as a field crop, but the few reports regarding their condition were favorable. The acreage of carrots is steadily decreasing.

**MANGELS.** These roots, like all others, made a poor start in the spring, but picked up later on. They are rather smaller in size than usual, but otherwise were regarded as a good crop when correspondents wrote in November, more especially in the West Midland counties. They were well secured for the winter.

**TURNIPS.** There was a poor catch at seeding, and the crop was regarded as being very backward early in the season. Timely rains in June helped turnips considerably, but drouth later on threw them back again, and a light yield has been the result. There were also some reports of injury from aphids and from rot. When correspondents reported at the beginning of November, the storing of turnips was not completed.

**SUGAR BEETS.** This crop is coming more into favour for feeding purposes. Like other roots, they were hardly as large in size as ordinarily, but in other respects were regarded as a fair average crop. They were pulled and stored in good time.

### FRUIT AND FRUIT TREES.

The condition of orchards was thus described in the May bulletin: "Winter losses of orchard trees are smaller than for several years. In various quarters a number of old plum trees are reported as having succumbed, but opinion was expressed that the severe winters of the two or three years immediately preceding was the cause. Except in a few localities in the Lake Erie counties, peaches appear to have sustained but little injury. There has been a generous amount of blossoming on nearly all classes of orchard trees, and should heavy rains keep off during the period of 'setting' a large fruit crop may be looked for. Complaints of the presence of San Jose scale, the oyster-shell bark louse, and black-knot are made, and orchardists will have to continue the fight against them if the best results are to be had."

The August bulletin thus summarized the fruit situation: "Harvest and fall apples will be plentiful, but standard winter varieties like the Spy and Greening, will be rather scarce. The fruit, however, will be a better sample than for years, being much freer from spot. Plums have not been so light in yield for several seasons; in some districts there will be hardly any for sale. There will be a good yield of peaches. Pears will not be a full crop; the trees have also suffered from blight in different localities. Cherries have borne well, but black-knot is still complained of. In some of the Lake Erie counties the Rose Beetle did much injury to grape vines early in the season, but in the other parts of the Province the yield of grapes is expected to be a fair one. There was an average supply of berries, strawberries being the least plentiful."



According to the November bulletin, orchard conditions were as follows : "Considerable injury to orchards was done in the second week of October by an early but heavy fall of moist snow, which settled on trees still laden with leaves (and some with fruit), the result being that many branches and limbs were broken off. In some of the Lake Erie and Lake Ontario counties complaints are made of injury to trees by the San Jose scale, and the borer is also reported as doing harm. Otherwise orchards appear to be in good condition for wintering. Fall apples were so abundant that many of them could not be used. Winter varieties have not given a full yield, but many heavy shipments are reported, and there is still a surplus on hand. Apples suffered less from spot or scab than in recent years, but the codling moth was too common, and there are many complaints of wormy fruit. Plums were never scarcer, but all other fruits were more or less equal to the demand."

### THE SUGAR BEET INDUSTRY.

The following statistics relate to beets grown for the production of sugar in the Province of Ontario.

The period covering the growing of the beets and their manufacture into sugar is called a "campaign." The first sugar campaign in this Province was that of 1902-3, when four factories were making. During the summer of 1904 the Wiarton factory was compelled to suspend operations owing to financial difficulties, and the Dresden factory was removed to the State of Michigan, leaving but two sugar factories operating in the Province, namely, those of Berlin and Wallaceburg. The following table shows the quantity of beet-root sugar made in Ontario by the factories in operation. It will be observed that more sugar was made in 1906-7 than in any previous campaign :

Campaign.	Factory.	Output of Sugar.
1902-3	Ontario Sugar Co., Berlin.....	lbs. 6,063,926
	Dresden Sugar Co. ....	3,763,987
	Wallaceburg Sugar Co. ....	3,606,604
	Warton Sugar Co. ....	1,565,000
	Total.....	14,999,517
1903-4	Ontario Sugar Co., Berlin.....	7,059,695
	Dresden Sugar Co. ....	2,094,999
	Wallaceburg Sugar Co. ....	4,230,422
	Warton Sugar Co. ....	981,000
	Total .....	14,366,016
1904-5	Ontario Sugar Co., Berlin.....	7,260,637
	Wallaceburg Sugar Co. ....	7,574,708
	Total .....	14,835,345
1905-6	Ontario Sugar Co., Berlin.....	9,510,753
	Wallaceburg Sugar Co. ....	11,276,066
	Total.....	20,786,829
1906-7	Ontario Sugar Co., Berlin.....	10,341,907
	Wallaceburg Sugar Co. ....	10,721,107
	Total.....	21,063,014

There were 3,200 farmers growing sugar beets for the campaign of 1905-6' and the area of beets raised by them was 10,647 acres, yielding 100,085 tons, or 9.55 tons to the acre. Each grower averaged three and a third acres of beets. The patrons of the Berlin factory were scattered over eighteen counties.

There is a steady demand in the Berlin district for beet pulp for cattle feeding at fifty cents a ton, but in the Wallaceburg district the bulk of the pulp is allowed to go to waste.

### MISCELLANEOUS.

**LUCERNE.** This plant, which is also known as alfalfa, is referred to in most favorable terms by several correspondents, as it permits of frequent cutting during the growing season, and is very nutritious. It thrives best on high land.

**RAPE.** The growing of rape is approved of by a number of correspondents who speak from personal experience. It is used for finishing off lambs in the fall, and cattle and other live stock are turned upon it with advantage. The spreading habit of the plant has a tendency to kill weeds by smothering them out.

**TOBACCO.** August reports regarding the condition of tobacco varied. The plants got a rather poor start, and the white grub also caused some loss early in the season. The favorable weather of July, however, enabled the crop to pick up wonderfully, and in most cases a good return was looked for.

November reports concerning tobacco were on the whole favorable. The plant matured well, and was harvested under ideal conditions, the leaf being remarkably free from sand and dirt. A little planted late got caught by frost. The yield was expected to average about 1,200 lbs. to the acre, which would bring the owner about \$90 where the quality was good. A few fields ran as high as 2,000 lbs. to the acre. Prices were not so high as in 1905, but the increased yield would offset the difference. A number of sales by individual growers were reported ranging from 10,000 to 20,000 lbs.

*The Leamington Post* gave the following comparative statement of the 1905 and 1906 crop of leaf tobacco in Essex and Kent counties, Ontario, and also that of the Province of Quebec:

	1905. lbs.	1906. lbs.
Mersea .....	1,750,000	1,850,000
Gosfield North .....	650,000	750,000
Gosfield South .....	1,250,000	1,200,000
Colchester .....	1,200,000	1,500,000
Malden .....	50,000	75,000
Sandwich .....	25,000	50,000
Pelee Island .....	400,000	400,000
Kent County .....	600,000	1,300,000
Scattering .....	150,000	250,000
Walker Bros. ....	200,000	200,000
Totals .....	6,275,000	7,575,000
Quebec .....	3,100,000	3,750,000
Total .....	9,375,000	11,325,000

**FLAX.** The acreage of flax is not so large as in former years, but the general tone of the reports this season is encouraging. Good weather prevailed when the crop was pulled, which ensured a good quality of fibre.



**WEEDS.** Farmers appear to be getting more thoroughly awake to the importance of abating the weed nuisance. The necessity of a better supervision of seed is shown by a correspondent in the county of Carleton, who asserts that Penny Cress was spread through that locality with clover seed, which it somewhat resembles. A correspondent in the county of York states that Ragweed is proving to be the worst weed in that section in both field and roadside. A correspondent in the county of Wellington thus describes his method of getting rid of the dreaded Russia Sow Thistle:—

“We have succeeded in killing the Russian Sow Thistle by giving the land a fair coat of manure and sowing rape, cultivating with the scuffler twice, and feeding the rape to lambs. We plow light after harvest, and later on plow deeper. We have also had good success in killing the thistle with buckwheat, plowing in the fall and twice in the spring, and sowing three pecks to the acre about the middle of June; we had 40 bushels to the acre. This land and the rape land had hitherto been almost useless, the thistle having had possession.”

The Department during the year issued a revised bulletin on Weeds (No. 128), which has been sent to a large number of rural school teachers. Copies are still available for any farmers who apply.

**FALL PLOWING.** Correspondents reporting about the 1st of November were about equally divided as to whether the progress of fall plowing is well advanced or backward. Reports differed greatly even in the same localities. It would seem, however, as if the comparatively hot and dry weather of August and September had rendered the land rather hard for plowing, but that later, more favorable conditions prevailed, and a large area was still being turned under as correspondents wrote. The rush of other fall work, and the absence of skilled labor, also had a tendency to delay plowing.

**THRESHING AND MARKETING.** The November bulletin said: “All over the Province threshing was well advanced, as correspondents reported. Wheat has not been so largely marketed as usual, prices not being considered as satisfactory by those who could afford to hold, while others are keeping it over to feed stock unless prices rise. Barley is now mainly fed to hogs and other live stock, and while considerable oats have been marketed much more will be used on the farm. Several correspondents claim that farmers are too busy with fall work to go to market, preferring to wait for the sleighing season.”

**FARM SUPPLIES.** The following appeared in the November bulletin: “In every section of the Province there has been enough hay and grain for local needs, but as a rule there is not much to spare, as the feeding of live stock is more engaged in than formerly. The failure of the turnip crop, and the necessity of feeding later than usual owing to the backward spring, also made great inroads upon the grain and fodder supply. Most of the fat cattle have been disposed of, but a considerable number of store cattle are on the grass for July and September delivery. Several correspondents claim that only a sufficient number of cattle will be left on hand for butchers' needs.

**FARM IMPROVEMENTS.** More or less activity in farm improvements is reported all over the Province. An immense amount of re-fencing has been done, some form of wire being substituted for the old rail or “worm” fences. A considerable number of new dwelling houses and barns have been erected, but much more has been done in the way of building stone or concrete foundations under remodelled houses and barns, in the latter case affording more comfortable and convenient stabling for live stock. More work would have been done in all these lines but for the scarcity of labor.

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## LIVE STOCK, THE APIARY, AND THE DAIRY.

**LIVE STOCK.** The May bulletin contained the following reference to live stock: "The open winter appears to have favored live stock. There was sufficient provender of all kinds except roots, as many of the turnips rotted, although the backward spring caused an unlooked for draft to be made upon surplus fodder. Horses came through the winter in splendid condition, except where troubled with a light form of distemper, and the cool, dry weather kept them in good condition during spring work. More mares have been bred of late than formerly, and while some correspondents speak of an unusual mortality among colts, the general tone of the reports is favorable in this regard. Owing to the high prices prevailing for horses they are commanding better care and closer attention. Cattle are described as being rather thin, but healthy. Several correspondents claim that this class of live stock was turned out upon the grass this season before there was a good bite for them. Sheep are now more in favor, and are giving good satisfaction. They would be more largely kept but for the dog nuisance. Lambs are coming in good and strong, to quote a correspondent. Swine are kept in large numbers, and have wintered well, but there are reports of heavy mortality among spring litters, a large number of young pigs dying when about a month old. But for the fact that many farmers have lost confidence in the stability of the market, the output of hogs would be immensely increased."

Pastures were in excellent condition up to the latter part of July, but were beginning to show need of rain when correspondents wrote early in August. Live stock generally were then in good form, except that cows had suffered much from the horn-fly, and had consequently lost in milk in many sections of the Province. No serious cases of disease among live stock were reported. Prospects were good for fall and winter keep, as there would be plenty of coarse grains, a good supply of ensilage corn, and an abundance of straw, although hay was likely to be somewhat scarcer than in more recent years.

The November bulletin said: "Pastures were rather short in midsummer, but picked up later on. Live stock generally are in a healthy condition. The breed and quality of horses are just now commanding more attention from farmers. Cattle are perhaps a trifle thin, but otherwise are in excellent shape for wintering. Sheep have been in demand, and are growing in favor, more especially as the price of lambs ranged high. One correspondent in Muskoka speaks of losses by bears, but several complaints come from some of the oldest settled districts of sheep being killed by dogs. A special enquiry as to the present condition of the sheep industry is now being made by the Department, and a bulletin will be issued soon on this subject. Hogs are somewhat scarcer than usual at this time of year, but are being sent steadily forward to market. There is a much smaller supply of hay on hand than for years, mill feed is high in price, and more care and judgment than usual will have to be exercised to carry live stock through until spring. The splendid crop of corn comes in most opportunely; but while there are many champions of the silo, a number of correspondents are disposed to considerably discount its benefits, especially when farm labor is so scarce. This winter will afford many practical tests of the value of corn ensilage in helping live stock through economically."

**POULTRY.** Farmers are giving much closer attention to the raising of poultry, and the comments of correspondents regarding this industry are more sympathetic and enthusiastic than formerly. Both eggs and dressed poultry have been in strong demand at paying prices, and there has been more profit than usual in their handling. More attention is being given to the matter of breed, and the industry is now a recognized branch of progressive farming.



VALUES PER HEAD. The statistics of live stock will be found on pages 37-41. The following table gives the average value per head of stock on hand for the past ten years :

Classes of Live Stock.	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897
Horses :	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Working horses.....	122	116	111	103	93	85	79	72	65	61
Breeding mares.....	128	121	114	106	95	87	81	74	68	64
Colts.....	83	78	73	67	62	57	53	49	44	41
Stallions.....	488	453	406	388	373	347	368	332	303	283
Cattle :										
Working oxen.....	46	42	44	45	42	42	42	46	43	42
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Milch cows.....	35 99	35 06	34 70	34 15	32 96	31 74	31 01	30 31	28 28	26 13
Store cattle.....	32 72	32 54	32 10	31 71	30 02	29 25	29 38	29 27	26 49	23 89
Other cattle.....	15 85	16 47	16 06	15 82	15 01	14 14	13 67	13 09	11 91	10 62
Sheep :										
Over one year.....	6 19	5 64	5 37	5 36	5 40	5 31	5 17	5 01	4 76	4 37
Under one year.....	4 01	3 59	3 34	3 35	3 37	3 37	3 31	3 15	2 91	2 62
Swine :										
Over one year.....	17 12	15 51	15 88	16 28	16 00	14 34	12 09	12 23	12 63	11 40
Under one year.....	5 38	4 97	4 90	5 07	5 15	4 81	4 24	3 92	3 91	3 67
Poultry :	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.	cts.
Turkeys.....	85	78	76	69	66	65	65	65	63	64
Geese.....	81	72	65	61	61	60	59	57	55	56
Ducks.....	42	38	36	33	33	31	30	29	.....	.....
Other fowls.....	31	30	28	27	26	24	23	22	22	21

BEEES AND HONEY. "The season has been a rather poor one for the apiary," said the August bulletin. "Swarming was uneven, and on the whole unsatisfactory. Clover was a disappointment; basswood was better, but only fair; buckwheat promises well. The weather was too wet for best results at the gathering time, and it is estimated that the average yield per colony will be only about 35 pounds. Bees are otherwise in a thrifty condition."

November returns were thus summarized: "The honey crop has been a failure this season. The average yield per colony is small, and the quality of the honey, generally speaking, is poor, both as regards color and flavor. The cold, wet season at the time of the main honey flow was the chief cause of disappointment. The situation was somewhat relieved by the good buckwheat bloom, but notwithstanding this aid some feeding back will be necessary in many apiaries. Otherwise bees are reported to be in good condition."

THE DAIRY. Dairying has been a most profitable branch of agriculture on account of the high prices prevailing for both butter and cheese. The former appears to be gaining upon the latter, as many farmers now use cream separators, sending the cream to the butter factory, and feeding the skim milk to calves and pigs. The milk flow was hardly as full or as steady as during the three or four years immediately preceding, but good prices have fully compensated. Shorthorn cows and their grades are still most commonly used, but Holsteins are gaining much in favor in dairy districts, followed by Ayrshires (particularly in the St. Lawrence counties) and Jerseys.

The statistics of the Cheese and Butter output of the year have always been in the nature of estimates, as many of the factories and creameries fail to make returns on schedules provided. An attempt is being made this year to collect the information through the Dairy Instructors. As soon as their efforts are completed the results will be published in bulletin form.

## LABOR AND WAGES.

May returns as to conditions governing farm labor and wages were to the following effect: The quality and cost, and not the quantity of labor, is the great question facing the Ontario farmer to-day. The exodus of native sons to the Canadian West and to New Ontario has drained the older parts of the Province of a large number of skilled agricultural workmen, and while the tide of immigration has brought in many to take their place, few of the newcomers prove to be up to the mark from a Canadian standpoint. However, some of them are reported to be 'making good,' and a more hopeful tone regarding the promise of raw labor is observed in the remarks of correspondents. Rates of wages continue high; in fact, many report that farmers cannot pay such wages and succeed. Enlarged implements and the use of more horses in field work help some out of the difficulty. Domestic servants are, if possible, harder to secure than ever before."

The August bulletin remarked: "Notwithstanding the large number of immigrants coming to Canada, farm labor in Ontario has been almost as scarce as ever. However, the reference to the quality of the old country help is more favorable than formerly. The high rates of wages during the harvest—ranging from \$1.25 to \$2 a day, with board, and from \$20 to \$40 a month—have forced farmers to do much of the work within their own families, the use of modern machinery enabling women to help in the fields during a rush. Farmers also exchange work with one another to mutual advantage. The comparatively light crop of hay this year lessened the demand for harvest help to some extent. On the other hand, "the attractions of the West, the lakes, and the mines," as one correspondent put it, has lured many of our most skilled young men from Ontario farms.

The labor situation was thus summed up in the November bulletin: "In only a few localities was the supply of farm labor equal to the demand. The continued exodus from this Province to the Northwest and New Ontario is given as the chief cause of the scarcity of able men to help on the farm. While some correspondents belittle the English immigrants as farm laborers, others say that there has been a great improvement in quality during the last year or so. The general opinion is that wages will remain at about the present rate, as farmers cannot afford to pay more. The situation is being somewhat relieved by the use of improved farm machinery, and by turning more land into pasture. It is almost impossible to secure domestic servants on the farm, as girls seem to prefer town life."

The following table gives the average rate of wages paid farm laborers by the year and by the month, with and without board, for ten years; also the monthly wages paid domestic servants on the farm:

Farm Laborers.	1906	1905	1904	1903	1902	1901	1900	1899	1898	1897
Per year in yearly engagements:										
With board.....	\$ 196	\$ 192	\$ 190	\$ 183	\$ 165	\$ 165	\$ 155	\$ 149	\$ 148	\$ 144
Without board.....	298	296	291	274	268	263	248	243	246	236
Per month for working season:										
With board.....	\$ c. 22 19	\$ c. 21 61	\$ c. 21 49	\$ c. 19 44	\$ c. 18 52	\$ c. 17 78	\$ c. 16 57	\$ c. 15 38	\$ c. 15 31	\$ c. 14 29
Without board.....	31 90	31 32	31 02	28 04	27 51	27 05	25 73	24 93	25 44	24 47
Domestic servants per month .....	8 92	8 86	8 07	7 84	7 15	6 91	6 65	6 19	6 09	5 97



## TEMPERATURE OF 1906.

TABLE I.—Showing for each month the highest, lowest, mean highest, mean lowest and mean temperature at the principal stations in Ontario in 1906; also the annual mean for each station.

Months.	Saugeen.	Birnam.	London.	Woodstock	Stoney Creek.	Toronto.	Lindsay.	Gravenhurst	Ottawa.	Rockliffe.
	o	o	o	o	o	o	o	o	o	o
January,...	Highest..... 58.8	61.3	60.0	60.0	69.0	56.5	55.4	51.0	52.0	43.0
	Lowest..... 5.6	8.7	5.5	5.0	8.0	5.2	- 8.0	-15.0	-10.0	-24.0
	Mean highest..... 36.3	35.3	36.5	36.5	39.3	37.0	33.4	32.3	29.2	25.0
	Mean lowest..... 21.9	25.1	23.2	22.5	25.9	24.9	17.2	13.9	12.3	2.2
	Monthly mean..... 29.1	30.2	29.9	30.0	32.6	31.0	25.3	23.1	20.8	13.6
February..	Highest..... 51.5	59.7	57.0	58.5	61.0	53.3	59.6	52.0	46.0	46.0
	Lowest..... -17.1	-12.1	-16.5	-15.0	-10.0	-12.1	-24.0	-32.0	-19.0	-40.0
	Mean highest..... 29.7	28.3	31.4	29.9	33.3	31.0	28.3	27.4	25.9	23.5
	Mean lowest..... 10.7	13.0	10.9	10.2	13.8	13.6	6.8	2.0	5.7	- 6.3
	Monthly mean..... 20.2	20.6	21.2	20.6	23.5	21.8	17.5	14.7	15.8	8.6
March ....	Highest..... 47.8	46.0	48.0	46.0	52.0	49.0	49.0	45.0	46.0	46.0
	Lowest..... 0.0	- 7.7	- 7.0	- 3.0	- 2.0	- 0.8	- 5.9	-17.0	- 0.0	-28.0
	Mean highest..... 31.0	29.5	32.5	30.7	33.4	33.2	31.6	30.9	30.3	29.7
	Mean lowest..... 16.3	17.7	18.2	16.7	21.7	20.8	14.5	9.9	15.2	3.1
	Monthly mean..... 23.7	23.6	25.3	24.4	27.6	26.8	23.1	20.4	22.7	16.4
April .....	Highest..... 70.0	72.3	74.0	73.0	75.0	72.0	71.7	72.0	72.0	74.0
	Lowest..... 21.2	21.2	25.5	26.0	25.0	26.0	20.8	18.0	20.0	11.0
	Mean highest..... 50.8	54.1	56.8	55.7	56.5	53.6	54.2	51.2	53.6	51.8
	Mean lowest..... 32.6	34.6	33.5	31.9	36.7	35.7	32.6	29.2	32.9	29.1
	Monthly mean..... 41.6	44.3	46.2	43.8	46.6	44.5	43.4	40.2	43.4	40.5
May .....	Highest..... 84.0	83.0	84.5	83.0	88.0	86.0	87.6	84.0	88.0	84.0
	Lowest..... 30.1	30.0	29.0	28.0	35.0	30.5	27.0	25.0	32.0	26.0
	Mean highest..... 61.2	64.9	67.0	64.2	66.4	64.2	66.4	62.5	64.6	61.2
	Mean lowest..... 41.6	45.7	44.6	42.8	44.8	44.3	41.7	40.1	43.2	38.5
	Monthly mean..... 51.4	55.3	55.8	54.5	55.6	53.2	54.0	51.3	53.9	49.8
June .....	Highest..... 86.1	90.0	89.5	88.8	96.0	91.0	86.7	85.0	86.0	88.0
	Lowest..... 34.6	38.2	37.5	35.0	40.0	42.2	38.7	32.0	40.0	33.0
	Mean highest..... 72.6	74.8	76.3	74.4	77.5	75.1	75.8	74.5	77.1	75.7
	Mean lowest..... 53.9	56.3	56.4	53.3	55.9	56.1	54.2	52.0	57.2	52.3
	Monthly mean..... 63.2	65.5	66.3	63.8	66.7	65.1	65.0	63.2	67.0	64.0
July .....	Highest..... 86.9	90.0	88.0	83.8	92.0	92.1	86.6	85.0	89.0	93.0
	Lowest..... 43.3	45.3	44.0	46.5	48.0	50.8	47.5	43.0	47.0	39.0
	Mean highest..... 75.5	77.4	78.6	77.8	81.9	79.9	79.9	78.9	81.0	81.7
	Mean lowest..... 57.8	58.7	57.4	55.6	60.4	60.3	57.0	54.8	60.0	53.2
	Monthly mean..... 66.5	68.0	68.0	67.6	68.9	69.6	68.5	66.7	70.5	67.4
August .....	Highest..... 86.0	88.0	89.0	87.0	96.0	89.0	90.2	90.0	95.0	94.0
	Lowest..... 41.1	52.1	46.0	46.0	46.0	52.0	45.7	39.0	48.0	42.0
	Mean highest..... 78.1	79.5	80.6	79.3	81.9	81.1	80.9	81.0	82.8	79.3
	Mean lowest..... 60.5	62.7	60.5	58.2	63.1	62.6	57.9	55.3	60.8	54.6
	Monthly mean..... 69.3	71.1	70.6	69.6	72.5	71.0	69.4	68.2	71.6	67.0
September..	Highest..... 85.0	88.0	87.0	86.0	93.0	90.4	87.8	88.0	89.0	90.0
	Lowest..... 37.1	40.0	36.0	34.5	42.0	41.7	37.4	35.0	38.0	34.0
	Mean highest..... 72.6	75.8	76.0	74.4	78.1	75.2	74.6	73.2	73.8	72.2
	Mean lowest..... 54.0	55.0	51.4	50.2	54.7	54.5	50.6	49.9	51.0	47.1
	Monthly mean..... 63.4	65.4	63.7	63.2	66.4	64.2	62.6	61.6	62.4	59.8
October.....	Highest..... 76.0	72.1	74.0	71.5	75.0	73.0	74.0	74.0	73.0	76.0
	Lowest..... 26.1	23.0	26.0	21.0	28.0	26.4	24.0	26.0	27.0	22.0
	Mean highest..... 59.5	55.7	58.6	55.7	58.4	58.9	57.2	56.0	55.1	55.2
	Mean lowest..... 40.0	41.5	38.9	37.0	41.7	41.3	37.9	36.7	38.5	34.8
	Monthly mean..... 48.7	48.6	48.8	47.2	49.5	48.3	47.5	46.4	46.8	44.0
November..	Highest..... 55.8	56.1	59.0	56.0	63.0	58.6	55.9	54.0	49.0	48.0
	Lowest..... 17.2	15.0	21.0	19.0	23.0	21.6	14.1	11.0	13.0	2.0
	Mean highest..... 43.0	43.2	45.1	41.5	45.0	43.6	40.3	40.1	37.8	36.9
	Mean lowest..... 29.6	30.6	29.5	28.4	32.7	31.2	26.1	25.8	26.8	22.4
	Monthly mean..... 36.3	36.9	37.8	35.5	38.8	37.1	33.2	33.0	32.3	29.6
December..	Highest..... 44.0	48.1	47.0	47.0	53.0	49.0	41.9	42.0	36.0	37.0
	Lowest..... - 1.0	8.0	2.0	- 5.0	0.0	- 8.1	-18.3	-26.6	-20.0	-36.0
	Mean highest..... 31.6	31.9	32.6	30.1	31.3	30.8	24.5	25.7	19.4	17.4
	Mean lowest..... 16.6	21.4	18.5	15.6	18.7	15.7	6.8	6.2	5.6	- 3.3
	Monthly mean..... 24.1	26.7	25.5	24.0	25.0	22.9	15.5	15.9	12.5	7.1
Annual mean.....	44.3	46.4	46.5	45.3	47.8	46.3	43.7	42.1	43.3	39.0

## AVERAGES OF TEMPERATURE FOR TWENTY-FIVE YEARS.

TABLE II.—Showing for each month the monthly average for the highest, lowest, mean highest, mean lowest and mean temperature at the principal stations in Ontario, derived from the twenty-five years 1882-1906; also the annual mean at each station for the same period.

Months.		Saugeen.	Birnam.	London.	Woodstock.	Stoney Creek.	Toronto.	Lindsay.	Gravenhurst.	Ottawa.	Rockliffe.
		o	o	o	o	o	o	o	o	o	o
January ...	Highest ..	44.5	46.2	46.3	46.0	51.3	44.9	41.7	41.5	40.2	37.5
	Lowest ..	- 6.7	- 9.0	- 9.2	-11.5	- 4.2	- 7.3	-19.9	-26.4	-21.5	-34.3
	Mean highest ..	28.2	26.9	28.6	27.7	32.4	28.9	24.2	24.0	19.8	18.1
	Mean lowest ..	13.2	14.5	13.7	11.3	18.1	14.2	6.6	3.9	1.6	- 6.1
	Monthly mean ..	20.8	20.8	21.8	20.7	23.4	22.0	15.6	14.5	11.1	6.0
February ...	Highest ..	44.7	47.1	46.2	45.6	48.4	44.2	42.3	42.2	40.3	41.6
	Lowest ..	-11.3	-12.9	-12.0	-11.8	- 6.5	- 8.1	-18.1	-25.9	-21.0	-35.2
	Mean highest ..	27.5	26.7	28.3	27.7	31.1	28.6	25.3	25.0	22.0	21.9
	Mean lowest ..	10.9	12.7	11.5	10.3	15.1	13.1	5.7	3.5	3.3	- 0.7
	Monthly mean ..	18.9	19.6	20.5	20.2	22.8	21.2	15.8	14.7	13.1	8.5
March .....	Highest ..	53.5	57.6	57.6	55.7	59.1	53.1	50.5	50.1	47.1	50.1
	Lowest ..	- 3.6	- 3.5	- 2.3	- 2.6	5.1	3.5	- 7.2	-13.5	- 8.6	-24.4
	Mean highest ..	34.8	35.8	37.2	35.9	39.6	35.9	33.8	33.5	32.3	32.9
	Mean lowest ..	17.6	20.9	20.1	18.5	24.8	21.5	15.6	12.9	14.7	6.7
	Monthly mean ..	26.1	27.9	29.3	28.0	31.0	28.8	24.6	23.6	23.7	19.9
April .....	Highest ..	73.3	77.0	76.1	74.8	77.5	70.9	74.4	71.2	74.0	74.9
	Lowest ..	15.5	17.8	18.6	17.5	23.4	21.2	14.1	11.7	15.2	6.7
	Mean highest ..	49.7	52.6	53.2	52.6	53.8	51.0	52.2	50.2	51.3	51.5
	Mean lowest ..	31.4	34.1	32.7	31.9	36.1	33.9	30.8	29.0	31.4	26.4
	Monthly mean ..	40.0	43.2	44.0	42.8	44.0	42.3	41.1	39.7	41.6	38.6
May .....	Highest ..	79.9	82.5	82.3	81.0	84.4	78.5	82.5	81.4	83.1	84.8
	Lowest ..	28.7	29.2	30.0	29.3	34.0	32.1	28.2	27.4	31.2	24.2
	Mean highest ..	61.3	65.7	66.6	64.7	65.8	62.5	66.0	64.1	66.4	65.8
	Mean lowest ..	41.4	44.6	44.2	42.7	45.5	44.0	42.1	41.6	43.4	38.5
	Monthly mean ..	50.9	55.0	56.4	54.4	54.9	53.2	53.8	52.8	55.6	51.9
June .....	Highest ..	85.1	88.2	87.8	87.1	91.7	86.8	88.5	87.0	87.9	89.3
	Lowest ..	37.6	37.6	38.5	38.6	42.9	42.5	39.2	36.8	42.2	33.7
	Mean highest ..	70.8	75.5	76.1	75.4	77.5	73.9	75.9	74.9	75.9	75.6
	Mean lowest ..	50.9	53.6	53.5	51.9	55.9	53.8	51.4	51.1	54.0	48.0
	Monthly mean ..	60.6	64.4	65.9	64.5	66.0	63.6	63.6	63.1	65.5	61.7
July .....	Highest ..	87.3	92.1	91.5	90.1	95.4	90.5	91.2	89.2	91.1	90.8
	Lowest ..	43.3	42.8	44.0	44.1	49.0	48.1	43.7	43.1	47.1	40.0
	Mean highest ..	77.3	79.8	80.0	79.4	82.8	78.6	79.8	78.3	79.0	78.2
	Mean lowest ..	55.9	57.2	57.2	55.6	61.1	58.4	55.4	55.5	58.2	52.9
	Monthly mean ..	65.2	68.4	69.7	68.3	71.1	68.8	67.3	66.9	68.8	65.0
August ...	Highest ..	86.0	89.9	89.5	88.6	93.0	87.8	89.4	87.7	88.6	88.2
	Lowest ..	42.0	42.2	40.5	41.7	46.8	46.6	40.5	40.0	43.5	37.4
	Mean highest ..	73.8	77.1	77.6	77.3	80.7	76.3	77.5	76.1	76.2	75.2
	Mean lowest ..	55.1	55.8	54.4	52.1	59.0	53.1	53.3	53.2	55.4	50.2
	Monthly mean ..	65.9	66.2	66.9	65.8	69.5	66.3	64.7	64.3	66.0	61.5
September ..	Highest ..	84.6	87.2	86.1	85.8	90.4	84.4	86.0	83.8	84.5	84.6
	Lowest ..	33.7	33.5	31.6	31.2	36.6	36.4	31.0	31.2	33.0	29.0
	Mean highest ..	68.4	70.8	71.3	70.4	74.2	69.2	69.6	68.8	68.5	67.8
	Mean lowest ..	49.7	50.8	49.5	47.3	53.0	50.7	46.8	47.1	47.9	43.5
	Monthly mean ..	58.3	60.7	60.8	59.4	62.4	59.7	57.6	57.5	58.2	54.1
October....	Highest ..	74.2	75.8	75.1	74.2	77.1	72.4	73.8	72.5	70.7	72.9
	Lowest ..	24.7	24.8	23.6	22.7	26.2	26.1	21.1	21.6	23.2	17.6
	Mean highest ..	56.3	57.1	57.7	56.4	61.0	56.0	55.3	55.3	53.8	53.8
	Mean lowest ..	39.5	40.6	38.2	36.8	41.7	39.9	36.2	36.9	36.6	33.0
	Monthly mean ..	47.1	48.8	48.3	47.1	50.1	47.9	45.1	45.5	45.4	42.2
November..	Highest ..	60.8	62.6	62.1	61.5	65.9	59.9	59.2	58.7	57.0	55.9
	Lowest ..	13.6	12.8	12.0	10.8	16.8	13.9	4.8	6.8	5.8	- 1.1
	Mean highest ..	45.3	42.7	44.1	42.7	47.0	43.4	40.4	40.4	38.4	36.8
	Mean lowest ..	29.9	30.6	29.2	27.7	32.4	30.5	25.8	25.9	25.2	21.6
	Monthly mean ..	36.1	36.7	36.9	35.8	39.3	37.0	32.9	33.1	31.8	28.9
December..	Highest ..	49.4	49.0	54.6	49.1	54.9	47.9	44.4	44.4	42.0	40.6
	Lowest ..	- 1.1	- 1.8	- 2.9	- 3.8	0.9	- 2.3	-13.8	-13.9	-16.7	-27.2
	Mean highest ..	33.2	31.7	33.0	32.0	36.0	33.4	28.7	29.1	24.5	23.5
	Mean lowest ..	20.1	20.7	19.7	17.8	22.6	20.4	13.1	12.5	8.8	3.5
	Monthly mean ..	26.6	26.2	26.8	25.7	29.6	27.2	21.3	21.3	17.0	13.3
Annual mean .....		43.0	44.8	45.6	44.4	47.0	44.8	42.0	41.4	41.5	37.6



## RAIN AND SNOW.

TABLE III. Summary of the total fall of rain and snow, and the number of days on which rain and snow fell in Ontario during the year 1906 at stations reporting the whole year, and the average for the Province.

Stations.	Rain.		Snow.		Stations.	Rain.		Snow.	
	Inches.	Days.	Inches.	Days.		Inches.	Days.	Inches.	Days.
ALGOMA :					NIPISSING :				
Port Arthur .....	22.71	62	23.0	25	Calvin .....				
Bruce Mines .....	25.70	85	65.1	26	Haileybury .....	18.24	79	104.0	56
Cockburn Island .....	21.85	65	46.5	27	NORFOLK :				
BRANT :					Port Dover .....	24.20	111	51.2	44
Paris .....	30.22	86	30.0	14	NORTHUMBERLAND :				
Brantford .....	27.46	43	25.5	15	Wooler .....	30.53	69	26.5	15
BRUCE :					OXFORD :				
Lucknow .....	28.44	91	99.2	56	Woodstock .....	33.78	108	35.3	23
N. Bruce .....	27.52	77	62.0	40	Princeton .....	35.56	76	58.0	23
Saugeen .....	25.30	87	87.0	61	ONTARIO :				
Warton .....	24.99	64	58.5	31	Uxbridge .....	30.73	85	48.0	34
CARLETON :					PARRY SOUND :				
Ottawa .....	20.05	78	63.1	40	Uplands .....	15.28	68	103.0	47
DUFFERIN :					Parry Sound .....	36.68	80	79.0	36
Orangeville .....	29.55	51	66.0	52	PEEL :				
DURHAM :					Alton .....	33.21	84	56.6	46
Port Hope .....	24.84	58	19.5	10	PETERBOROUGH :				
ESSEX :					Peterborough .....	30.98	65	71.5	30
Cottam .....	30.41	96	17.5	18	Lakefield .....	27.05	73	40.5	19
Windsor .....	29.44	99	24.5	18	Otonabee .....	25.24	64	41.0	22
Wallaceburg .....	20.36	71	37.5	13	RAINY RIVER :				
ELGIN :					Kenora .....	17.41	35	50.0	19
Port Stanley .....	31.53	126	40.5	43	RENFREW :				
Cowal .....	27.31	60	34.0	23	Clontarf .....	18.52	59	46.5	28
Port Burwell .....	27.42	84	30.9	22	Rockliffe .....	13.85	59	59.1	39
FRONTENAC :					Renfrew .....	17.29	59	64.4	31
Arden .....	30.31	102	53.0	29	SIMCOE :				
Kingston .....	26.31	94	59.7	60	Orillia .....	23.12	48	59.1	26
Sydenham .....	31.34	82	43.0	16	Midland .....	25.83	70	42.8	28
GREY :					VICTORIA :				
Owen Sound .....	26.01	81	91.9	59	Lindsay .....	29.91	98	92.7	53
Meaford .....	26.63	84	69.5	35	WENTWORT :				
HALTON :					Stony Creek .....	35.50	76	35.5	15
Georgetown .....	30.66	111	9.5	53	YORK :				
HASTINGS :					Aurora .....	31.28	95	52.1	40
Madoc .....	35.08	91	58.1	41	Scarboro .....	23.30	94	26.3	23
HURON :					Deer Park .....	25.40	68	37.1	26
Goderich .....	16.93	51	54.5	25	Toronto .....	27.21	109	37.7	44
Clinton .....	29.98	115	78.5	41	Agincourt .....	20.11	50	40.1	23
KENT :					Sutton West .....	32.15	97	24.0	19
Chatham .....	24.57	52	21.5	7	WELLAND :				
LAMBTON :					Welland .....	27.07	86	56.5	26
Wyoming .....	21.92	54	58.0	25	Average for the Province				
Sarnia .....	18.80	34	61.1	23	1906 .....	27.06	76	52.4	32
Birnam .....	30.38	85	91.4	35	1905 .....	24.90	78	64.3	39
LANARK :					1904 .....	25.60	77	75.0	43
Montague .....	20.83	49	26.0	14	1903 .....	26.44	78	69.8	40
LEEDS :					1902 .....	28.29	97	54.8	82
Lansdowne .....	23.93	48	25.4	17	1901 .....	24.12	79	76.3	43
Westport .....	29.86	69	35.7	32	1900 .....	25.28	81	64.6	34
LENNOX :					1899 .....	25.13	87	60.5	54
Parma .....	29.39	71	41.0	23	1898 .....	24.90	81	74.2	44
MIDDLESEX :					1897 .....	28.30	88	73.0	49
London .....	34.68	103	75.3	40	1896 .....	22.36	82	73.4	43
Westminster .....	23.27	62	56.5	18	1882-06 .....	24.56	87	73.6	40
MUSKOKA :									
Emsdale .....	37.17	95	78.2	39					
Gravenhurst .....	29.46	79	66.9	45					
Bala .....	30.45	76	81.0	86					
Huntsville .....	33.22	54	66.8	38					

## RAIN AND SNOW.

TABLE IV.—Monthly summary of inches of rain and snow in precipitation in the several districts of Ontario in 1906; also the average derived from the twenty-five years 1882-1906.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	in.		in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
West and Southwest:													
Rain..... { 1906.....	1.27	0.48	1.01	1.61	2.51	3.78	3.12	2.60	1.77	5.08	1.86	2.97	28.06
{ 1882-1906.....	1.09	1.26	1.36	1.83	3.20	3.09	2.97	2.60	2.57	2.78	2.27	1.56	26.58
Snow..... { 1906.....	7.3	3.6	13.2	1.1	.....	.....	.....	.....	.....	8.0	1.6	9.0	43.8
{ 1882-1906.....	15.3	12.5	8.8	2.6	8	.....	.....	.....	.....	0.6	5.5	12.0	57.3
Northwest and North:													
Rain..... { 1906.....	1.32	0.39	0.97	1.19	2.44	4.34	2.66	3.19	2.55	3.98	2.24	0.85	26.12
{ 1882-1906.....	0.76	0.53	0.99	1.42	2.70	2.89	2.94	2.83	3.09	3.05	1.87	0.99	24.06
Snow..... { 1906.....	15.7	13.1	11.8	2.6	.....	.....	.....	.....	.....	4.1	5.1	14.8	67.2
{ 1882-1906.....	26.2	20.2	13.2	3.4	0.3	.....	.....	.....	.....	1.5	12.5	21.7	99.0
Centre:													
Rain..... { 1906.....	1.46	0.50	1.33	1.70	2.61	4.12	3.87	2.30	2.32	3.94	1.75	1.47	27.37
{ 1882-1906.....	1.05	1.02	1.31	1.72	2.81	2.93	2.84	2.48	2.44	2.47	1.99	1.36	24.42
Snow..... { 1906.....	8.0	4.9	13.0	1.7	.....	.....	.....	.....	.....	5.3	2.3	12.4	47.6
{ 1882-1906.....	17.9	14.5	9.7	3.0	0.1	.....	.....	.....	.....	0.6	5.4	11.4	62.6
East and Northeast:													
Rain..... { 1906.....	1.31	0.49	1.20	1.13	1.79	5.83	2.07	2.19	2.99	4.02	2.20	1.46	26.68
{ 1882-1906.....	0.85	0.67	1.16	1.47	2.63	3.00	3.00	2.60	2.52	2.32	1.77	1.18	23.17
Snow..... { 1906.....	9.7	6.8	8.5	1.3	.....	.....	.....	.....	.....	9.9	2.2	12.7	51.1
{ 1881-1906.....	21.0	17.3	11.0	3.2	0.1	.....	.....	.....	.....	0.9	7.5	14.5	75.5
The Province:													
Rain..... { 1906.....	1.34	0.46	1.13	1.41	2.34	4.52	2.93	2.57	2.41	4.25	2.01	1.69	27.06
{ 1882-1906.....	0.94	0.87	1.20	1.61	2.83	2.98	2.94	2.63	2.65	2.66	1.98	1.27	24.56
Snow..... { 1906.....	10.2	7.1	11.6	1.7	.....	.....	.....	.....	.....	6.8	2.8	12.2	52.4
{ 1882-1906.....	20.1	16.1	10.7	3.1	0.1	.....	.....	.....	.....	0.9	7.7	14.9	73.6

## SUNSHINE.

TABLE V.—Monthly summary of bright sunshine at the principal stations in Ontario in 1906 showing the number of hours the sun was above the horizon, the hours of registered sunshine, the total for the year and the average derived from the twenty-five years 1882-1906.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.	hrs.
Sun above horizon .....	285.7	291.4	369.9	406.4	461.1	465.7	470.9	434.5	376.3	340.2	286.9	274.3	4463.3
Woodstock..... { 1906.....	78.2	135.5	100.2	191.2	220.7	258.1	259.7	237.4	226.1	115.4	82.6	57.6	1962.7
{ 1882-1906.....	62.1	89.2	123.9	176.1	207.7	243.1	272.0	236.6	177.5	147.1	75.5	54.1	1861.9
Toronto..... { 1906.....	88.0	138.7	116.2	205.2	223.5	210.5	260.3	251.4	243.8	128.8	81.3	68.7	2015.4
{ 1882-1906.....	79.3	108.1	150.4	194.3	221.1	256.5	280.5	251.5	211.5	147.6	83.1	64.4	2048.3
Lindsay..... { 1906.....	81.4	140.4	137.7	208.8	209.1	202.0	264.3	233.3	260.3	130.1	82.6	72.7	2022.7
{ 1882-1906.....	74.3	105.1	153.6	196.4	213.8	243.7	259.9	242.6	197.3	136.2	71.2	57.1	1951.2
Kingston..... { 1906.....	107.8	140.2	147.0	196.8	238.6	249.4	295.2	282.4	242.5	112.4	78.9	56.6	2147.8
{ 1882-1906.....	77.6	109.7	152.6	189.5	200.8	246.0	267.0	244.2	194.4	137.6	79.1	68.3	1966.8
Ottawa..... { 1906.....	87.5	132.3	163.7	206.6	201.8	224.0	272.2	273.8	215.8	138.6	95.8	72.6	2084.9
{ 1882-1906.....	82.9	104.3	141.7	185.2	224.2	221.4	243.1	236.3	166.5	125.2	86.8	56.4	1874.0
Average of five stations..... { 1906.....	88.6	135.4	133.0	201.6	218.6	228.8	270.3	255.7	237.7	125.1	84.2	65.6	2044.6
{ 1905.....	80.6	116.1	157.7	169.8	206.5	210.4	236.8	261.6	194.6	151.8	95.9	63.8	1945.7
{ 1882-1906.....	75.2	103.3	144.4	188.3	217.5	242.1	264.5	242.2	189.4	138.7	78.5	60.5	1944.6



## TORONTO OBSERVATORY REGISTER.

TABLE VI.—Comparative Meteorological Register for the seven years 1900-1906, at Toronto Observatory in Lat. 43°. 40 N., and Lon. 5 h. 17m. 34.65s. W. Height above the sea 350 feet.

	1906	1905	1904	1903	1902	1901	1900
Average temperature.....	46° 26	44° 53	42° 20	45° 58	45° 57	45° 55	46° 89
Difference from average (66 years).....	+ 1.87	+ 0.14	- 2.19	+ 1.19	+ 1.18	+ 1.16	+ 2.50
Thermic Anomaly (Lat. 43° 40').....	- 4.76	- 6.49	- 8.82	- 5.44	- 5.45	- 5.47	- 4.13
Highest temperature.....	92.1	92.1	93.0	91.5	91.0	97.1	98.0
Lowest temperature.....	- 12.1	- 8.2	- 15.1	- 9.7	- 3.3	- 10.9	- 9.6
Annual range.....	104.2	100.3	108.1	101.2	94.3	108.0	107.6
Average daily range.....	16.73	17.01	17.29	16.68	16.81	16.90	16.70
Greatest daily range.....	36.9	35.6	36.0	34.5	33.2	43.0	37.6
Average height of barometer at 32° Fah....	29.6577	29.6273	29.6380	29.6203	29.5940	29.5988	29.6213
Difference from average (65 years).....	+ .0381	+ .0077	+ .0184	+ .0007	- .0256	- .0208	+ .0017
Highest barometer.....	30.505	30.493	30.449	30.809	30.394	30.328	30.224
Lowest barometer.....	28.752	28.840	28.752	28.742	28.712	28.868	28.802
Annual range.....	1.753	1.653	1.697	1.567	1.682	1.460	1.422
Average of cloudiness.....	0.57	0.58	0.60	0.61	0.62	0.61	0.57
Difference from average.....	- .04	- .03	- .01	.00	+ .01	.00	- .04
Average humidity of the air.....	77	78	79	76	77	76	76
Difference from average.....	0	+ .1	+ 2	- 1	0	- 1	- 1
Resultant direction of wind.....	N 25° W	S 87° W	N 67° W	W	N 60° W	N 55° W	S 88° W
Resultant velocity of wind.....	2.64	2.73	2.09	2.45	2.53	2.99	3.09
Average velocity (miles per hour).....	10.78	9.72	10.17	10.83	10.98	10.26	10.97
Difference from average.....	+ 0.37	- 0.64	- 0.19	+ 0.47	+ 0.62	- 0.10	+ 0.61
Highest velocity in month and year.....	49.0	54.0	50.0	40.0	44.0	45.0	44.0
Total amount of rain in inches.....	27.206	25.825	30.040	25.631	26.105	25.200	22.130
Difference from average (66 years).....	+ 0.136	- 1.245	+ 2.970	- 1.439	- .965	- 1.870	- 4.940
Number of days of rain.....	109	97	100	100	116	102	99
Total amount of snow in inches.....	37.7	54.3	56.5	50.0	49.2	70.7	74.6
Difference from average (66 years).....	- 28.94	- 12.34	- 10.14	- 16.64	- 17.44	+ 4.06	+ 7.96
Number of days of snow.....	66.64	49	53	52	37	54	42
Number of fair days.....	178	190	175	171	181	183	187
Number of days completely clouded.....	54	59	61	61	59	58	51
Number of auroras observed.....	2	6	2	5	2	2	3
Possible to see auroras (No. of nights)....	13	196	177	184	185	201	244
Number of thunder storms.....	37	30	37	26	34	29	34
Number of fogs.....	19	23	26	22	31	29	29
Number of hours of bright sunshine.....	2016.4	2064.2	1974.9	2039.9	1958.9	1981.6	2305.0
Number of hours of possible sunshine....	4464.1	4464.1	4475.2	4464.1	4464.1	4464.1	4464.1

## RURAL AREAS ASSESSED.

TABLE VII.—Showing by County Municipalities the rural area of Ontario as returned by Municipal assessors for 1906; also the comparative totals for the Province for the ten years 1895-1906.

Counties and Districts.	Acres of assessed land.	Acres cleared.	Acres of woodland.	Acres of slash land.	Acres swamp, marsh or waste land.	Per cent. cleared.
Algoma .....	471,978	55,751	350,086	14,058	52,083	11.8
Brant .....	215,904	177,816	12,428	13,143	12,517	82.4
Bruce .....	922,537	548,303	165,596	73,332	135,306	59.4
Carleton .....	555,153	343,702	61,868	91,997	67,586	60.8
Dufferin .....	355,239	254,718	29,267	32,575	38,679	71.7
Dundas .....	236,715	165,976	39,715	18,231	12,793	70.1
Durham .....	370,264	298,212	36,646	15,285	20,121	80.5
Elgin .....	434,981	342,637	63,569	21,940	6,835	78.8
Essex .....	426,374	320,585	56,092	41,187	8,510	75.2
Frontenac .....	693,623	302,928	136,566	160,157	93,972	43.7
Glengarry .....	289,186	198,981	59,089	11,995	19,121	68.8
Grenville .....	272,833	179,507	35,073	23,145	35,108	65.8
Grey .....	1,072,554	687,165	145,321	65,264	174,804	64.1
Haldimand .....	281,202	236,176	34,265	5,728	5,033	84.0
Haliburton .....	577,934	40,376	318,208	33,971	185,379	7.0
Halton .....	224,805	172,589	21,302	24,994	5,920	76.8
Hastings .....	1,061,003	435,391	303,833	110,729	211,050	41.0
Huron .....	799,551	645,701	60,608	23,246	69,996	80.8
Kent .....	568,061	457,237	53,875	37,012	19,937	80.5
Lambton .....	659,851	471,079	76,670	89,864	22,238	71.4
Lanark .....	674,392	318,632	184,486	28,624	142,650	47.2
Leeds .....	468,227	265,547	98,855	39,045	64,780	56.7
Lennox and Addington .....	442,099	273,437	106,870	15,293	46,499	61.8
Lincoln .....	190,526	163,190	17,205	6,945	3,186	85.7
Manitoulin .....	257,890	42,594	100,629	79,647	35,020	16.5
Middlesex .....	757,795	653,609	80,368	14,097	9,721	86.3
Muskoka .....	554,854	63,994	416,703	26,099	48,058	11.5
Nipissing .....	527,179	45,117	409,597	9,164	63,301	8.6
Norfolk .....	399,010	269,645	72,278	31,473	25,614	67.6
Northumberland .....	438,141	341,576	39,980	18,717	37,868	78.0
Ontario .....	502,438	367,379	26,322	49,505	59,232	73.1
Oxford .....	471,114	392,455	40,072	14,302	24,285	83.3
Parry Sound .....	601,515	73,587	400,727	42,309	84,892	12.2
Peel .....	288,203	260,014	12,243	6,455	9,491	90.2
Perth .....	517,756	446,377	35,609	21,452	14,318	86.2
Peterborough .....	572,113	257,218	125,146	95,897	93,852	45.0
Prescott .....	291,116	196,864	34,703	43,311	16,238	67.6
Prince Edward .....	231,568	192,889	20,781	2,834	15,064	83.3
Rainy River .....	266,563	16,887	202,935	20,978	25,763	6.3
Renfrew .....	1,024,670	353,447	384,523	72,286	214,414	34.5
Russell .....	253,573	120,993	40,842	70,031	21,707	47.7
Simcoe .....	965,567	632,865	122,073	138,821	71,808	65.5
Stormont .....	248,626	152,015	42,075	41,907	12,629	61.1
Thunder Bay .....	266,345	8,475	169,595	22,000	66,275	3.2
Victoria .....	602,274	282,589	48,858	88,868	181,959	46.9
Waterloo .....	307,064	251,307	33,214	4,852	17,691	81.8
Welland .....	227,613	185,275	21,354	6,798	14,186	81.4
Wellington .....	628,624	494,706	38,052	16,796	79,070	78.7
Wentworth .....	271,049	210,305	20,433	13,160	27,151	77.6
York .....	537,078	439,197	42,520	13,831	41,530	81.8
The Province :						
1906 .....	24,284,730	14,107,015	5,449,125	1,963,350	2,765,240	58.1
1905 .....	24,184,540	13,931,437	5,594,673	1,811,992	2,846,438	57.6
1904 .....	24,138,846	13,809,368	6,670,902	.....	3,658,576	57.2
1903 .....	23,930,512	13,643,069	6,719,720	.....	3,567,723	57.0
1902 .....	23,727,010	13,570,229	6,684,512	.....	3,472,269	57.2
1901 .....	23,636,178	13,436,482	6,715,872	.....	3,483,824	56.8
1900 .....	23,568,104	13,297,206	7,127,363	.....	3,143,535	56.4
1899 .....	23,451,092	13,111,292	7,149,404	.....	3,190,396	55.9
1898 .....	23,392,584	12,993,614	7,198,905	.....	3,200,065	56.5
1897 .....	23,360,428	12,853,081	7,294,026	.....	3,213,321	55.0



## FALL WHEAT AND SPRING WHEAT.

TABLE VIII. Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Fall Wheat and Spring Wheat for the year 1906, together with the totals for the Province for the past ten years and the average for the twenty-five years, 1882-1906; also the average yield per acre.

Counties and Districts.	Fall Wheat.				Spring Wheat.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
*Algoma .....	353	8,719	24.7	\$ 6,164	714	14,994	21.0	\$ 10,331
Brant .....	22,589	594,091	26.3	420,022	215	3,978	18.5	2,741
Bruce .....	32,550	781,200	24.0	552,308	1,427	27,398	19.2	18,877
Carleton .....	603	14,472	24.0	10,232	6,138	127,057	20.7	87,542
Dufferin .....	3,881	91,204	23.5	64,481	4,760	96,152	20.2	66,249
Dundas .....	338	7,098	21.0	5,018	557	11,641	20.9	8,021
Durham .....	7,714	182,050	23.6	128,709	10,906	189,764	17.4	130,747
Elgin .....	27,207	644,806	23.7	455,878	105	1,827	17.4	1,259
Essex .....	18,067	429,995	23.8	304,006	722	12,491	17.3	8,606
Frontenac .....	477	8,634	18.1	6,104	4,332	75,377	17.4	51,935
Glengarry .....	68	1,360	20.0	962	3,553	64,665	18.2	44,554
Grenville .....	166	3,934	23.7	2,781	1,176	24,931	21.2	17,178
Grey .....	26,607	678,479	25.5	479,685	5,156	100,026	19.4	68,918
Haldimand .....	30,464	664,115	21.8	469,529	392	6,703	17.1	4,618
Haliburton .....	30	660	22.0	467	629	10,064	16.0	6,934
Halton .....	24,069	488,601	20.3	345,441	795	12,720	16.0	8,764
Hastings .....	8,365	173,156	20.7	122,421	4,278	75,293	17.6	51,877
Huron .....	35,481	911,862	25.7	644,686	1,614	33,087	20.5	22,797
Kent .....	58,892	1,372,184	23.3	970,134	1,424	26,059	18.3	17,955
Lambton .....	35,613	772,802	21.7	546,371	641	11,218	17.5	7,729
Lanark .....	1,978	29,670	15.0	20,977	7,316	139,004	19.0	95,774
Leeds .....	1,117	24,239	21.7	17,137	2,176	40,691	18.7	28,036
Lennox & Add..	1,558	32,562	20.9	23,021	3,493	59,730	17.1	41,154
Lincoln .....	16,733	364,779	21.8	257,899	172	2,374	13.8	1,636
Manitoulin .....	560	12,992	23.2	9,185	579	10,364	17.9	7,141
Middlesex .....	48,125	1,241,626	25.8	877,830	230	4,071	17.7	2,805
Muskoka .....	70	1,470	21.0	1,039	616	10,102	16.4	6,960
Nipissing .....	37	814	22.0	576	475	8,598	18.1	5,924
Norfolk .....	35,872	860,928	24.0	608,676	174	3,045	17.5	2,098
Northumberl'nd.	16,973	400,563	23.6	283,198	7,912	137,669	17.4	94,854
Ontario .....	12,096	322,963	26.7	228,335	15,026	305,028	20.3	210,164
Oxford .....	31,168	804,134	25.8	568,523	217	4,297	19.8	2,961
Parry Sound....	18	378	21.0	267	586	11,954	20.4	8,236
Peel .....	23,742	508,079	21.4	359,212	1,153	19,832	17.2	13,664
Perth .....	35,927	887,397	24.7	627,390	801	16,260	20.3	11,203
Peterborough ...	12,160	294,272	24.2	208,050	5,513	105,298	19.1	72,550
Prescott .....					4,073	64,353	15.8	44,339
Prince Edward..	2,409	49,625	20.6	35,085	1,064	17,982	16.9	12,390
Renfrew .....	617	11,846	19.2	8,375	30,204	576,896	19.1	397,481
Russell .....	270	5,940	22.0	4,200	1,677	30,354	18.1	20,914
Simcoe .....	72,885	1,785,683	24.5	1,262,478	9,555	177,723	18.6	122,451
Stormont .....	75	1,875	25.0	1,326	1,167	21,706	18.6	14,955
Victoria .....	9,800	228,340	23.3	161,436	9,631	174,321	18.1	120,107
Waterloo .....	32,390	796,794	24.6	563,333	126	2,545	20.2	1,755
Welland .....	19,806	441,674	22.3	312,264	248	3,472	14.0	2,392
Wellington .....	12,089	293,763	24.3	207,691	5,248	115,456	22.0	79,549
Wentworth .....	29,216	701,184	24.0	495,737	265	4,373	16.5	3,013
York .....	36,062	908,762	25.2	642,495	12,514	274,057	21.9	188,825
The Province:								
1906 .....	787,287	18,841,774	23.9	13,321,134	171,745	3,267,000	19.0	2,250,963
1905 .....	796,213	17,933,961	22.5	13,719,480	190,116	3,582,627	18.8	2,683,387
1904 .....	605,458	9,160,623	15.1	9,041,535	225,027	3,471,103	15.4	3,269,779
1903 .....	665,028	17,242,763	25.9	12,949,315	248,518	4,650,707	18.7	3,460,126
1902 .....	748,592	20,233,669	27.0	14,305,204	303,115	6,048,024	20.0	4,209,425
1901 .....	911,587	15,943,229	17.5	10,538,474	358,048	5,498,751	15.4	3,673,166
1900 .....	1,068,640	23,369,737	21.9	15,517,505	376,905	6,940,333	18.4	4,684,725
1899 .....	1,049,691	14,439,827	13.3	9,631,365	398,726	7,041,317	17.7	4,682,476
1898 .....	1,048,182	25,158,713	24.0	17,460,147	389,205	6,873,785	17.7	3,756,659
1897 .....	950,222	23,988,051	25.2	18,758,656	323,305	4,868,101	15.1	3,826,627
1882-1906...	877,559	18,027,531	20.5	14,093,857	413,502	6,556,316	15.9	5,279,006

\* Including Rainy River and Thunder Bay in this and succeeding tables.

## BARLEY AND OATS.

TABLE IX.—Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Barley and Oats for the year 1906, together with the totals for the Province for the past ten years and the average for the twenty-five years, 1882-1906; also the average yield per acre.

Counties and Districts.	Barley.				Oats.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
Algoma .....	2,225	69,198	31.1	\$ 31,139	17,458	665,150	38.1	\$ 226,151
Brant .....	12,792	429,811	33.6	193,415	29,438	1,257,003	42.7	427,381
Bruce .....	23,724	749,678	31.6	337,355	102,230	3,772,287	36.9	1,282,577
Carleton .....	9,283	323,977	34.9	145,790	81,276	3,413,592	42.0	1,160,621
Dufferin .....	18,464	688,707	37.3	309,918	72,591	2,976,231	41.0	1,011,919
Dundas .....	4,159	134,752	32.4	60,638	37,193	1,562,106	42.0	531,116
Durham .....	29,853	907,531	30.4	408,389	58,333	2,216,654	38.0	753,662
Elgin .....	16,009	571,521	35.7	257,184	47,318	1,925,843	40.7	654,787
Essex .....	11,424	389,558	34.1	175,301	73,782	3,039,818	41.2	1,033,538
Frontenac .....	8,347	238,724	28.6	107,426	48,568	1,704,737	35.1	579,611
Glengarry .....	7,056	211,680	30.0	95,256	39,094	1,317,468	33.7	447,939
Grenville .....	3,178	89,302	28.1	40,186	33,664	1,272,499	37.8	432,650
Grey .....	34,974	1,196,111	34.2	538,250	144,432	5,618,405	38.9	1,910,258
Haldimand .....	8,294	255,455	30.8	114,955	35,876	1,363,288	38.0	463,518
Haliburton .....	601	19,172	31.9	8,627	6,625	220,613	33.3	75,008
Halton .....	11,121	379,226	34.1	170,652	26,286	1,138,184	43.3	386,983
Hastings .....	27,029	827,087	30.6	372,189	70,697	2,608,719	36.9	886,964
Huron .....	33,643	1,251,520	37.2	563,184	123,546	5,188,932	42.0	1,764,237
Kent .....	25,552	876,434	34.3	394,395	74,636	3,246,666	43.5	1,033,866
Lambton .....	25,348	775,649	30.6	349,042	88,946	3,468,894	39.0	1,179,424
Lanark .....	6,898	219,356	31.8	98,710	48,167	1,844,796	38.3	627,231
Leeds .....	6,540	204,702	31.3	92,116	51,645	1,774,714	36.3	637,402
Lennox & Add .....	13,919	379,989	27.3	170,995	47,723	1,646,444	34.5	559,791
Lincoln .....	2,925	92,723	31.7	41,725	23,149	972,258	42.0	330,568
Manitoulin .....	1,865	57,442	30.8	25,849	6,502	219,768	33.8	74,721
Middlesex .....	27,470	997,161	36.3	448,722	102,295	4,460,062	43.6	1,516,421
Muskoka .....	692	17,438	25.2	7,847	11,196	338,119	30.2	114,960
Nipissing .....	609	16,626	27.3	7,482	7,354	234,593	31.9	79,762
Norfolk .....	9,877	303,224	30.7	136,451	37,688	1,405,762	37.3	477,959
Northumberland .....	20,428	598,540	29.3	269,343	55,742	2,079,177	37.3	706,902
Ontario .....	31,537	1,015,491	32.2	456,971	85,638	3,082,968	36.0	1,048,209
Oxford .....	22,005	840,591	38.2	378,266	80,001	3,728,047	46.6	1,267,536
Perry Sound .....	1,273	33,735	26.5	15,181	15,058	519,501	34.5	176,630
Peel .....	29,185	931,002	31.9	418,951	50,175	2,117,385	42.2	719,911
Perth .....	29,754	1,133,627	38.1	510,132	104,417	4,677,882	44.8	1,590,480
Peterborough .....	9,898	316,736	32.0	142,531	51,562	2,036,699	39.5	692,478
Prescott .....	4,601	130,208	28.3	58,594	40,556	1,265,347	31.2	430,218
Prince Edward .....	16,265	461,926	28.4	207,867	24,556	832,448	33.9	283,032
Renfrew .....	4,371	118,891	27.2	53,501	57,155	2,051,865	35.9	697,634
Russell .....	3,958	119,532	30.2	53,789	29,358	986,429	33.6	335,386
Simcoe .....	61,426	2,076,199	33.8	934,290	116,419	4,761,537	40.9	1,618,923
Stormont .....	3,777	117,842	31.2	53,029	29,458	1,240,182	42.1	421,662
Victoria .....	17,026	556,750	32.7	250,537	71,122	2,702,636	38.0	918,896
Waterloo .....	20,909	763,179	36.5	343,431	60,532	2,808,685	46.4	954,953
Welland .....	2,232	64,728	29.0	29,128	29,533	1,107,488	37.5	376,546
Wellington .....	35,903	1,346,363	37.5	605,863	129,859	5,493,036	42.3	1,867,632
Wentworth .....	13,241	454,166	34.3	204,375	36,274	1,599,683	44.1	543,892
York .....	44,503	1,499,751	33.7	674,888	101,588	4,276,855	42.1	1,454,131
The Province:								
1906 .....	756,163	25,253,011	33.4	11,363,855	2,716,711	108,341,455	39.9	36,836,095
1905 .....	772,633	24,265,394	31.4	10,409,854	2,668,416	105,563,572	39.6	35,469,360
1904 .....	772,434	24,567,825	31.8	10,736,140	2,654,936	102,173,443	38.5	33,002,022
1903 .....	709,839	24,378,817	34.3	10,263,482	2,638,665	109,874,053	41.6	32,193,097
1902 .....	661,622	21,890,602	33.1	9,872,661	2,500,758	106,431,439	42.6	37,038,141
1901 .....	637,201	16,761,076	26.3	7,542,484	2,408,464	78,334,490	32.5	28,357,085
1900 .....	577,810	16,909,751	29.3	6,577,893	2,398,834	89,693,327	37.4	23,768,732
1899 .....	490,374	14,830,891	30.2	5,858,202	2,363,778	89,897,724	38.0	24,901,670
1898 .....	438,784	12,663,668	28.9	4,812,194	2,376,360	86,858,293	36.6	22,409,440
1897 .....	451,515	12,021,779	26.6	3,245,880	2,432,491	86,318,128	35.5	19,502,897
1882-1906 .....	643,779	17,794,295	27.6	8,339,614	2,109,222	76,351,384	36.2	24,236,405



## PEAS AND BEANS.

TABLE X. Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Peas and Beans for the year 1906, together with the totals for the Province for the past ten years and the average for the twenty-five years, 1882-1906; also the average yield per acre.

Counties and Districts.	Peas.				Beans.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
Algoma .....	3,286	74,263	22.6	\$ 52,430	15	225	15.0	\$ 313
Brant .....	5,764	87,036	15.1	61,447	623	12,149	19.5	16,887
Bruce .....	28,927	630,609	21.8	445,210	98	1,960	20.0	2,724
Carleton .....	2,518	52,374	20.8	36,976	322	5,635	17.5	7,833
Dufferin .....	8,723	145,674	16.7	102,846	235	4,230	18.0	5,880
Dundas .....	348	7,064	20.3	4,987	144	2,333	16.2	3,243
Durham .....	17,308	261,351	15.1	184,514	484	8,664	17.9	12,043
Elgin .....	6,150	118,695	19.3	83,799	5,951	117,235	19.7	162,957
Essex .....	1,443	30,592	21.2	21,598	270	4,671	17.3	6,493
Frontenac .....	1,140	18,012	15.8	12,716	358	8,950	25.0	12,441
Glengarry .....	662	8,606	13.0	6,076	169	3,380	20.0	4,698
Grenville .....	427	9,181	21.5	6,482	106	2,120	20.0	2,947
Grey .....	30,997	641,638	20.7	452,996	148	2,960	20.0	4,114
Haldimand .....	14,163	192,617	13.6	135,988	425	7,650	18.0	10,634
Haliburton .....	1,164	19,672	16.9	13,888	13	260	20.0	361
Halton .....	8,349	132,749	15.9	93,721	38	684	18.0	951
Hastings .....	9,200	160,080	17.4	113,016	245	4,655	19.0	6,470
Huron .....	19,795	397,880	20.1	280,903	356	7,512	21.1	10,442
Kent .....	2,569	54,463	21.2	38,451	30,695	561,719	18.3	780,789
Lambton .....	3,780	74,088	19.6	52,306	940	15,134	16.1	21,036
Lanark .....	3,063	52,684	17.2	37,195	220	3,960	18.0	5,504
Leeds .....	971	19,614	20.2	13,847	220	3,520	16.0	4,893
Lennox & Add..	5,854	114,153	19.5	80,592	313	6,260	20.0	8,701
Lincoln .....	4,370	69,920	16.0	49,364	382	7,525	19.7	10,460
Manitoulin .....	2,935	59,287	20.2	41,857	13	260	20.0	361
Middlesex .....	8,269	171,168	20.7	120,845	800	16,560	20.7	23,018
Muskoka .....	1,942	31,655	16.3	22,348	22	396	18.0	550
Nipissing .....	1,476	34,243	23.2	24,176	8	144	18.0	200
Norfolk .....	10,871	154,368	14.2	108,984	2,252	43,689	19.4	60,728
Northumberland..	16,880	298,776	17.7	210,936	543	9,774	18.0	13,586
Ontario .....	14,926	247,772	16.6	174,927	229	4,580	20.0	6,366
Oxford .....	7,085	142,409	20.1	100,541	78	1,638	21.0	2,277
Parry Sound .....	3,071	66,027	21.5	46,615	22	396	18.0	550
Peel .....	10,657	144,935	13.6	102,324	71	1,420	20.0	1,974
Perth .....	11,714	241,308	20.6	170,363	10	170	17.0	236
Peterborough .....	14,724	287,118	19.5	202,705	78	1,326	17.0	1,843
Prescott .....	800	12,640	15.8	8,924	92	1,840	20.0	2,558
Prince Edward ..	7,734	143,079	18.5	101,014	382	7,640	20.0	10,620
Renfrew .....	16,936	304,848	18.0	215,222	323	4,490	13.9	6,241
Russell .....	860	13,330	15.5	9,411	172	3,440	20.0	4,782
Simcoe .....	30,512	564,472	18.5	398,517	640	11,840	18.5	16,458
Stormont .....	269	5,568	20.7	3,931	205	4,920	24.0	6,839
Victoria .....	13,461	209,992	15.6	148,254	273	4,914	18.0	6,830
Waterloo .....	6,839	127,889	18.7	90,290	33	594	18.0	826
Welland .....	3,017	57,926	19.2	40,896	1,786	28,576	16.0	39,721
Wellington .....	18,157	295,959	16.3	208,947	91	1,593	17.5	2,214
Wentworth .....	8,047	126,338	15.7	89,195	101	1,717	17.0	2,387
York .....	18,203	274,865	15.1	194,055	278	5,004	18.0	6,955
The Province ..								
1906 .....	410,356	7,388,987	18.0	5,216,625	51,272	950,312	18.5	1,320,934
1905 .....	374,518	7,100,021	19.0	4,636,314	50,543	846,443	16.7	1,117,305
1904 .....	339,260	6,629,866	19.5	4,176,816	50,892	912,849	17.9	1,113,676
1903 .....	407,133	8,924,650	21.9	5,738,550	53,039	978,246	18.4	1,379,327
1902 .....	532,639	7,664,679	14.4	5,441,922	53,964	670,633	12.4	905,355
1901 .....	602,724	10,089,173	16.7	6,588,230	53,688	824,122	15.4	1,030,153
1900 .....	661,592	14,058,198	21.2	8,027,231	44,053	820,373	18.6	817,912
1899 .....	743,139	15,140,790	20.4	8,675,673	40,485	651,009	16.1	703,090
1898 .....	865,951	13,521,263	15.6	7,058,099	45,220	759,657	16.8	531,760
1897 .....	896,735	13,867,093	15.5	5,838,046	50,591	981,340	19.4	639,834
1882-1906 .....	658,069	12,768,753	19.4	7,483,202	41,530	712,335	17.2	778,851

## RYE AND BUCKWHEAT.

TABLE XI.—Showing by County Municipalities of Ontario, the area, produce, and market value of the crops of Rye and Buckwheat for the year 1906, together with the totals for the Province for the past ten years, and the average for the twenty-five years 1882-1906, also the average per acre.

Counties and Districts.	Rye.				Buckwheat.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Bushels.	Per acre.	Market value.
Algoma .....	140	3,080	22.0	\$ 1,876	99	1,485	15.0	\$ 735
Brant .....	3,575	66,853	18.7	40,714	1,968	30,110	15.3	14,905
Bruce .....	653	11,362	17.4	6,919	1,294	23,033	17.8	11,401
Carleton .....	465	8,510	18.3	5,183	2,087	34,227	16.4	16,942
Dufferin .....	2,758	49,644	18.0	30,233	3,402	81,648	24.0	40,416
Dundas .....	130	2,184	16.8	1,330	1,153	20,408	17.7	10,102
Durham .....	3,514	52,359	14.9	31,887	4,729	75,664	16.0	37,454
Elgin .....	2,734	48,118	17.6	29,304	2,522	46,657	18.5	23,095
Essex .....	1,412	28,946	20.5	17,628	1,347	25,324	18.8	12,535
Frontenac .....	1,664	28,288	17.0	17,227	1,271	18,175	14.3	8,997
Glengarry .....	113	1,808	16.0	1,101	964	21,208	22.0	10,498
Grenville .....	435	7,917	18.2	4,821	2,898	46,948	16.2	23,239
Grey .....	293	4,893	16.7	2,980	3,335	75,038	22.5	37,144
Haldimand .....	1,659	25,217	15.2	15,357	779	13,399	17.2	6,633
Haliburton .....	5	80	16.0	49	400	8,000	20.0	3,960
Halton .....	355	5,325	15.0	3,243	296	5,032	17.0	2,491
Hastings .....	4,989	85,312	17.1	51,955	4,683	92,723	19.8	45,898
Huron .....	412	8,693	21.1	5,294	1,830	35,319	19.3	17,483
Kent .....	835	17,953	21.5	10,933	836	13,376	16.0	6,621
Lambton .....	534	10,680	20.0	6,504	453	9,060	20.0	4,485
Lanark .....	259	4,066	15.7	2,476	2,782	45,068	16.2	22,309
Leeds .....	456	7,615	16.7	4,638	2,627	39,930	15.2	19,765
Lennox & Addington.	3,078	45,862	14.9	27,930	6,352	72,413	11.4	35,845
Lincoln .....	1,432	25,490	17.2	15,523	344	4,334	12.6	2,145
Manitoulin .....	66	1,188	18.0	723	30	750	25.0	371
Middlesex .....	715	13,442	18.8	8,186	703	15,325	21.8	7,586
Muskoka .....	133	1,968	14.8	1,199	158	2,259	14.3	1,118
Nipissing .....	17	340	20.0	207	40	800	20.0	396
Norfolk .....	9,952	158,237	15.9	96,366	8,692	137,334	15.8	67,980
Northumberland .....	7,159	104,521	14.6	63,653	7,988	105,442	13.2	52,194
Ontario .....	4,560	84,816	18.6	51,653	5,899	89,665	15.2	44,384
Oxford .....	1,473	26,219	17.8	15,967	1,473	32,406	22.0	16,041
Parry Sound .....	184	3,956	21.5	2,409	85	1,471	17.3	728
Peel .....	1,106	16,922	15.3	10,305	752	16,544	22.0	8,189
Perth .....	121	1,815	15.0	1,105	299	7,475	25.0	3,700
Peterborough .....	1,881	23,106	17.6	14,072	1,668	30,858	18.5	15,275
Prescott .....	41	615	15.0	374	1,152	19,008	16.5	9,409
Prince Edward .....	5,411	86,576	16.0	52,725	4,444	52,439	11.8	25,957
Renfrew .....	1,307	17,775	13.6	10,825	758	15,918	21.0	7,879
Russell .....					870	11,310	13.0	5,598
Simcoe .....	5,051	84,857	16.8	51,678	6,235	104,748	16.8	51,850
Stormont .....	9	198	22.0	121	1,502	33,044	22.0	16,357
Victoria .....	1,352	24,336	18.0	14,821	7,036	121,723	17.3	60,253
Waterloo .....	1,797	34,682	19.3	21,121	473	9,460	20.0	4,683
Welland .....	1,657	28,998	17.5	17,660	1,998	32,168	16.1	15,923
Wellington .....	208	3,827	18.4	2,331	2,124	50,976	24.0	25,233
Wentworth .....	1,645	26,978	16.4	16,430	1,518	27,779	18.3	13,751
York .....	2,075	31,955	15.4	19,461	2,096	35,422	16.9	17,534
The Province :								
1906 .....	79,870	1,327,582	16.6	808,497	106,444	1,792,903	16.8	887,487
1905 .....	101,292	1,714,951	16.9	974,092	101,591	2,199,652	21.7	1,099,826
1904 .....	130,702	2,001,826	15.3	1,153,052	100,608	2,066,234	20.5	1,004,190
1903 .....	179,277	2,970,768	16.6	1,443,793	95,487	2,049,169	21.5	907,782
1902 .....	189,318	3,509,332	18.5	1,772,213	93,324	1,911,683	20.5	917,608
1901 .....	158,236	2,545,263	16.1	1,254,817	88,266	1,757,071	19.9	850,422
1900 .....	142,213	2,357,635	16.6	1,143,453	102,570	1,874,261	18.3	819,052
1899 .....	137,824	2,284,846	16.6	1,142,423	132,082	2,203,299	16.7	1,002,501
1898 .....	165,089	2,673,234	16.2	1,162,857	150,394	2,373,645	15.8	906,732
1897 .....	187,785	3,382,005	18.0	1,275,016	151,669	3,464,186	22.8	1,039,256
1882-1906 .....	120,348	1,969,777	16.4	1,025,243	99,992	1,946,501	19.5	806,940



## CORN.\*

TABLE XII.—Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Corn for husking and for fodder for the year 1906, together with the totals for the Province for the past ten years and the average for the fifteen years, 1892-1906, also the averages per acre.

Counties and Districts.	Corn for husking.				Corn for silo.			
	Acres.	Bushels.	Per acre.	Market value.	Acres.	Tons (green)	Per acre.	Market value.
Algoma .....	37	1,110	30.0	\$ 417	46	230	5.00	\$ 460
Brant .....	4,401	360,882	82.0	135,691	3,890	42,790	11.00	85,580
Bruce .....	627	25,080	40.0	9,430	3,688	45,584	12.36	91,168
Carleton .....	1,177	47,080	40.0	17,702	8,712	121,968	14.00	243,936
Dufferin .....	16	800	50.0	301	206	2,987	14.50	5,974
Dundas .....	2,367	175,158	74.0	65,859	4,959	70,517	14.22	141,034
Durham .....	1,583	106,061	67.0	39,879	2,907	33,721	11.60	67,442
Elgin .....	22,480	1,933,280	86.0	726,913	5,168	50,233	9.72	100,466
Essex .....	72,836	6,535,240	90.0	2,464,770	1,561	8,976	5.75	17,952
Frontenac .....	2,503	220,264	88.0	82,819	3,351	41,318	12.33	82,636
Glengarry .....	870	50,460	58.0	18,973	4,252	60,378	14.20	120,756
Grenville .....	2,903	211,919	73.0	79,681	3,981	51,076	12.83	102,152
Grey .....	322	16,100	50.0	6,054	3,650	48,947	13.41	97,894
Haldimand .....	2,564	192,300	75.0	72,305	2,174	21,740	10.00	43,480
Haliburton .....	97	3,880	40.0	1,459	66	924	14.00	1,848
Halton .....	561	29,733	53.0	11,180	3,255	36,521	11.22	73,042
Hastings .....	5,503	363,198	66.0	136,562	7,573	80,567	10.64	161,134
Huron .....	1,004	51,204	51.0	19,253	7,809	111,200	14.24	222,400
Kent .....	63,782	5,740,380	90.0	2,158,383	2,599	20,870	8.03	41,740
Lambton .....	18,308	1,446,332	79.0	543,821	7,366	75,207	10.21	150,414
Lanark .....	1,302	82,026	63.0	30,842	5,260	68,380	13.00	136,760
Leeds .....	5,124	420,168	82.0	157,983	3,611	44,993	12.46	89,986
Lennox & Addington .....	3,142	238,792	76.0	89,786	1,445	16,618	11.50	33,236
Lincoln .....	7,191	510,561	71.0	191,971	1,631	15,005	9.20	30,010
Manitoulin .....	15	600	40.0	226	111	1,277	11.50	2,554
Middlesex .....	15,449	1,297,716	84.0	487,941	11,723	113,479	9.68	226,958
Muskoka .....	157	9,420	60.0	3,542	168	1,092	6.50	2,184
Nipissing .....	73	2,920	40.0	1,098	37	259	7.00	518
Norfolk .....	14,862	1,084,926	73.0	407,932	4,456	39,391	8.84	78,782
Northumberland .....	3,838	234,118	61.0	88,028	4,686	50,375	10.75	100,750
Ontario .....	2,166	147,288	68.0	55,380	5,417	63,433	11.71	126,866
Oxford .....	8,347	667,760	80.0	251,078	11,348	125,963	11.10	251,926
Parry Sound .....	140	7,000	50.0	2,632	56	700	12.50	1,400
Peel .....	415	33,200	80.0	12,483	3,066	42,924	14.00	85,848
Perth .....	242	14,520	60.0	5,460	7,872	98,951	12.57	197,902
Peterborough .....	386	25,090	65.0	9,434	1,945	20,753	10.67	41,506
Prescott .....	2,742	216,618	79.0	81,448	2,372	33,208	14.00	66,416
Prince Edward .....	6,155	437,005	71.0	164,314	3,197	32,673	10.22	65,346
Renfrew .....	457	22,850	50.0	8,592	1,970	18,380	9.33	36,780
Russell .....	934	80,324	86.0	30,202	2,180	29,430	13.50	58,860
Simcoe .....	1,166	65,296	56.0	24,551	3,431	44,980	13.11	89,960
Stormont .....	1,122	98,736	88.0	37,125	3,912	55,902	14.29	111,804
Victoria .....	264	13,200	50.0	4,963	2,156	30,723	14.50	61,446
Waterloo .....	543	34,209	63.0	12,863	4,247	58,736	13.83	117,472
Welland .....	6,936	534,072	77.0	200,811	1,233	12,515	10.15	25,030
Wellington .....	152	12,160	80.0	4,572	2,552	34,809	13.64	69,618
Wentworth .....	1,799	140,322	78.0	52,761	5,010	48,647	9.71	97,294
York .....	396	27,324	69.0	10,274	8,491	120,063	14.14	240,126
The Province ;								
1906 .....	289,456	23,988,682	82.9	9,019,744	180,796	2,149,413	11.89	4,298,826
1905 .....	295,005	20,922,919	70.9	7,720,557	184,784	2,284,812	12.36	4,569,624
1904 .....	329,882	20,241,914	61.4	7,570,476	193,115	2,023,340	10.48	4,046,680
1903 .....	378,924	29,287,888	77.3	10,807,230	209,727	2,564,400	12.23	5,128,800
1902 .....	371,959	20,512,194	55.1	8,327,951	209,859	2,611,334	12.44	5,222,668
1901 .....	323,923	24,838,105	76.7	9,438,480	197,932	2,359,514	11.92	4,719,028
1900 .....	330,772	27,093,561	81.9	8,588,659	179,798	2,147,532	11.94	4,295,064
1899 .....	333,590	21,673,234	65.0	4,291,300	171,935	1,697,755	9.87	3,395,510
1898 .....	330,748	23,442,593	70.9	4,711,961	189,948	2,128,073	11.20	4,256,146
1897 .....	333,030	24,663,998	73.6	4,858,808	209,005	2,669,822	12.77	5,339,644
1892-1906, 15 yrs. ....	307,066	21,808,944	71.0	6,255,233	170,293	1,960,575	11.51	3,921,150

\* The combined average area for corn for the twenty-five years 1882-1906, is 364,766 acres, the average value of the produce for the same period being \$7,698,256.

## POTATOES AND CARROTS.

TABLE XIII. Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Potatoes and Carrots for the year 1906, together with the totals for the Province for the past ten years, and the average for the twenty-five years, 1882-1906; also the averages per acre.

Counties and Districts.	Potatoes.				Carrots.			
	Acres.	Bushels.	Per acre	Market value.	Acres.	Bushels.	Per acre	Market value.
Algoma .....	1,744	254,624	146	\$ 136,987	124	40,052	372	\$ 5,006
Brant .....	2,364	290,772	123	156,435	43	16,985	560	2,123
Bruce .....	3,344	448,096	134	241,076	246	67,404	449	8,426
Carleton .....	3,662	465,074	127	250,210	198	70,092	417	8,761
Dufferin .....	2,227	207,111	93	111,426	52	14,196	482	1,774
Dundas .....	1,974	238,854	121	128,504	62	13,764	327	1,720
Durham .....	2,498	299,760	120	161,271	77	33,341	492	4,168
Elgin .....	2,733	333,426	122	179,383	83	29,714	477	3,714
Essex .....	3,097	300,409	97	161,620	103	30,900	392	3,863
Frontenac .....	3,760	406,080	108	218,471	195	54,210	394	6,776
Glengarry .....	2,032	219,456	108	118,067	67	23,182	406	2,898
Grenville .....	2,682	329,886	123	177,479	131	34,977	407	4,372
Grey .....	5,105	704,490	138	379,016	137	48,224	447	6,028
Haldimand .....	1,288	113,344	88	60,979	32	9,056	395	1,132
Haliburton .....	598	60,996	102	32,816	19	4,978	360	622
Halton .....	1,428	145,656	102	78,363	47	12,455	448	1,557
Hastings .....	4,657	512,270	110	275,601	192	61,248	382	7,656
Huron .....	3,446	441,088	128	237,305	147	49,980	498	6,247
Kent .....	3,149	349,539	111	188,052	64	21,824	421	2,728
Lambton .....	3,038	297,724	98	160,176	132	37,356	461	4,670
Lanark .....	2,201	319,145	145	171,700	94	31,584	390	3,948
Leeds .....	2,901	371,328	128	199,775	155	42,005	385	5,251
Lennox and Addington	3,240	349,920	108	188,257	77	14,322	287	1,790
Lincoln .....	1,997	171,742	86	92,397	131	40,479	412	5,060
Manitoulin .....	513	66,177	129	35,603	39	12,675	406	1,584
Middlesex .....	5,174	600,184	116	322,899	200	79,800	475	9,975
Muskoka .....	1,089	143,748	132	77,336	81	27,621	250	3,453
Nipissing .....	1,078	121,814	113	65,536	41	10,742	287	1,343
Norfolk .....	2,800	280,000	100	150,640	122	37,332	398	4,666
Northumberland .....	4,153	415,300	100	223,432	133	46,151	392	5,769
Ontario .....	3,475	337,075	97	181,346	51	13,005	462	1,626
Oxford .....	2,676	329,148	123	177,082	59	25,193	560	3,149
Parry Sound .....	1,248	194,688	156	104,742	83	28,967	483	3,621
Peel .....	2,909	258,901	89	139,289	62	27,714	483	3,464
Perth .....	2,984	393,888	132	211,912	88	34,672	506	4,334
Peterborough .....	2,664	301,032	113	161,955	126	37,170	404	4,646
Prescott .....	2,762	317,630	115	170,885	117	38,579	356	4,197
Prince Edward .....	1,964	163,012	83	87,700	70	17,780	392	2,223
Renfrew .....	3,461	467,235	135	251,372	145	43,500	387	5,437
Russell .....	1,227	184,050	150	99,019	140	31,500	250	3,938
Simcoe .....	7,146	771,768	108	415,211	228	80,256	480	10,032
Stormont .....	1,825	235,425	129	126,659	84	21,924	366	2,741
Victoria .....	2,457	196,560	80	105,749	48	16,800	478	2,100
Waterloo .....	2,837	295,048	104	158,736	100	37,100	484	4,638
Welland .....	2,852	245,272	86	131,956	52	16,536	407	2,067
Wellington .....	4,107	369,630	90	198,861	103	36,153	534	4,519
Wentworth .....	3,359	309,028	92	166,257	50	20,800	538	2,600
York .....	6,139	392,896	64	211,378	150	59,400	396	7,425
The Province:								
1906 .....	136,064	15,020,299	110	8,080,921	4,980	1,598,698	321	199,837
1905 .....	132,530	14,366,049	108	6,608,383	5,509	1,846,659	335	230,832
1904 .....	133,819	15,479,122	116	7,847,915	6,634	2,022,945	305	252,868
1903 .....	139,011	16,676,447	120	7,354,313	7,805	2,612,778	335	326,597
1902 .....	144,733	12,942,502	89	7,312,514	8,625	3,227,161	374	403,395
1901 .....	154,155	18,116,637	118	7,717,687	9,221	3,199,967	347	399,996
1900 .....	163,754	21,476,439	131	5,605,351	10,320	3,469,123	336	433,640
1899 .....	168,148	19,933,366	119	6,538,144	11,891	3,674,035	309	459,254
1898 .....	169,946	14,358,625	84	6,332,154	12,418	4,313,861	347	539,233
1897 .....	169,333	16,100,797	95	6,424,218	12,025	4,433,628	369	554,204
1882-1906 .....	155,406	17,837,505	115	7,338,880	9,976	3,468,284	348	433,535



## MANGEL-WURZELS AND TURNIPS.

TABLE XIV. Showing by County Municipalities of Ontario, the area, produce and market value of the crops of Mangel-Wurzels and Turnips for the year 1906, together with the totals for the Province for the past ten years and the average for the twenty-five years, 1882-1906; also the averages per acre.

Counties and Districts.	Mangel-Wurzels.				Turnips.			
	Acres.	Bushels.	Per acre	Market value.	Acres.	Bushels.	Per acre	Market value.
Algoma .....	70	26,040	323	\$ 2,083	1,037	399,245	385	\$ 39,925
Brant .....	1,717	961,520	395	76,922	2,852	1,386,072	486	138,607
Bruce .....	3,616	1,623,584	274	129,887	7,518	3,104,934	413	310,493
Carleton .....	1,327	553,359	354	44,269	2,419	1,071,617	443	107,162
Dufferin .....	566	272,812	273	21,825	4,388	1,878,064	428	187,806
Dundas .....	153	50,031	222	4,002	93	36,642	394	3,664
Durham .....	2,099	1,032,708	433	82,617	6,010	2,458,090	409	245,809
Elgin .....	970	462,690	358	37,015	238	84,490	355	8,449
Essex .....	703	275,576	300	22,046	71	21,300	300	2,130
Frontenac .....	542	213,548	278	17,084	455	162,890	358	16,289
Glengarry .....	223	90,538	346	7,243	269	119,974	446	11,997
Grenville .....	219	89,133	267	7,131	233	99,491	427	9,449
Grey .....	3,850	1,720,950	352	137,676	11,092	5,346,344	482	534,634
Haldimand .....	492	194,340	283	15,547	98	25,872	264	2,587
Haliburton .....	22	7,920	262	634	213	82,431	387	8,243
Halton .....	1,690	757,120	265	60,570	1,192	483,952	406	48,395
Hastings .....	829	316,678	319	25,334	1,811	702,068	388	70,267
Huron .....	5,397	2,687,706	340	215,016	8,234	3,482,982	423	348,298
Kent .....	931	391,951	341	31,356	123	33,825	275	3,382
Lambton .....	1,601	738,061	283	59,045	239	84,367	353	8,437
Lanark .....	607	236,730	336	18,938	1,087	453,279	417	45,328
Leeds .....	431	165,935	271	13,275	559	206,271	369	20,627
Lennox and Addington	269	77,203	186	6,176	206	57,062	277	5,706
Lincoln .....	524	215,888	309	17,271	202	69,286	343	6,929
Manitoulin .....	45	18,270	325	1,462	365	159,140	436	15,914
Middlesex .....	2,942	1,397,450	399	111,796	2,189	917,191	419	91,719
Muskoka .....	50	12,500	341	1,000	558	211,482	379	21,148
Nipissing .....	17	4,879	262	390	267	79,566	298	7,957
Norfolk .....	845	336,310	306	26,905	1,166	381,282	327	38,128
Northumberland .....	1,375	539,000	347	43,120	4,818	1,373,130	285	137,313
Ontario .....	3,698	1,708,476	255	133,678	11,578	4,828,026	417	482,803
Oxford .....	3,520	1,971,200	427	157,696	5,780	2,762,840	478	276,284
Parry Sound .....	57	27,531	349	2,202	1,032	420,024	407	42,002
Peel .....	1,270	613,410	447	49,072	1,894	850,406	449	85,041
Perth .....	4,729	2,392,874	394	191,430	5,242	2,552,854	487	255,286
Peterborough .....	1,393	562,772	295	45,022	2,254	1,003,030	445	100,303
Prescott .....	195	69,420	287	5,554	243	78,975	325	7,898
Prince Edward .....	323	126,616	254	10,129	142	40,328	284	4,033
Renfrew .....	517	200,079	300	16,006	821	256,973	313	25,697
Russell .....	327	81,750	225	6,540	577	144,250	250	14,425
Simcoe .....	2,913	1,398,240	352	111,859	9,447	4,411,749	467	441,175
Stormont .....	120	43,920	261	3,514	139	39,893	287	3,989
Victoria .....	1,739	831,242	350	66,499	5,141	2,380,283	463	238,028
Waterloo .....	2,303	1,114,652	371	89,172	4,866	2,072,916	426	207,292
Welland .....	314	127,798	318	10,224	185	66,415	359	6,642
Wellington .....	4,493	2,399,262	351	191,941	13,583	6,058,018	446	605,802
Wentworth .....	2,097	1,128,186	416	90,255	1,936	846,032	437	84,603
York .....	5,222	2,595,334	497	207,627	7,650	3,274,200	428	327,420
The Province:								
1906 .....	69,352	32,863,192	474	2,629,055	132,512	57,060,151	431	5,706,015
1905 .....	69,035	33,216,930	481	2,657,354	135,348	57,654,086	426	5,765,409
1904 .....	71,344	33,595,440	471	2,687,635	133,207	64,861,703	487	6,486,170
1903 .....	80,918	41,768,239	516	3,341,459	134,469	69,316,341	515	6,931,634
1902 .....	76,553	39,140,924	511	3,131,274	136,725	71,740,204	525	7,174,020
1901 .....	61,095	29,683,324	486	2,374,666	145,909	68,287,467	468	5,828,747
1900 .....	54,543	24,728,525	453	1,978,282	156,583	59,330,395	379	5,933,040
1899 .....	53,401	20,898,387	391	1,671,871	153,440	58,078,390	379	5,807,839
1898 .....	47,923	21,957,564	458	1,756,605	151,601	64,727,882	427	6,472,788
1897 .....	41,175	18,103,387	440	1,448,271	149,336	68,297,148	457	8,829,715
1882-1906 .....	38,500	17,784,518	462	1,422,761	127,699	55,387,584	434	5,538,758

## HAY AND CLOVER—ALL FIELD CROPS.

TABLE XV. Showing by County Municipalities of Ontario, the area, produce and market value of the crop of Hay and Clover for the year 1906, together with the totals for the Province for the past ten years and the average for the twenty-five years, 1882-1906; also the average per acre. It also shows the aggregate area and the market value of all the field crops enumerated in Tables VIII-XV.

Counties and Districts.	Hay and Clover.				All field crops.		
	Acres.	Tons.	Per acre.	Market value.	Acres.	Market value.	Per acre.
Algoma .....	34,933	54,845	1.57	\$ 499,090	62,281	\$1,013,107	\$16 27
Brant .....	33,733	60,045	1.78	546,410	125,964	2,319,280	18 41
Bruce .....	120,365	136,012	1.13	1,237,709	330,307	4,685,560	14 19
Carleton .....	82,077	100,955	1.23	918,690	202,264	3,061,849	15 14
Dufferin .....	48,521	81,030	1.67	737,373	170,790	2,698,421	15 80
Dundas .....	48,822	77,139	1.58	701,965	102,452	1,671,203	16 31
Durham .....	50,033	97,064	1.94	883,282	198,048	3,171,873	16 02
Elgin .....	67,348	89,573	1.33	815,114	207,016	3,539,317	17 10
Essex .....	50,372	87,144	1.73	793,010	237,210	5,045,096	21 27
Frontenac .....	85,198	162,728	1.91	1,480,825	162,161	2,701,357	16 66
Glengarry .....	59,682	74,006	1.24	673,455	119,074	1,564,473	13 14
Grenville .....	48,585	74,821	1.54	680,871	100,784	1,591,919	15 80
Grey .....	150,511	177,603	1.18	1,616,187	420,609	6,271,834	14 91
Haldimand .....	67,114	86,577	1.29	787,851	165,814	2,205,113	13 30
Haliburton .....	14,258	16,112	1.13	146,619	24,740	301,535	12 19
Halton .....	34,743	58,368	1.68	531,149	114,225	1,816,502	15 90
Hastings .....	110,719	176,043	1.59	1,001,991	260,770	3,929,335	15 07
Huron .....	122,750	174,305	1.42	1,586,176	365,464	5,943,721	16 26
Kent .....	74,099	122,263	1.65	1,112,593	340,186	6,861,378	20 17
Lambton .....	97,630	139,611	1.43	1,270,460	284,569	4,363,920	15 34
Lanark .....	70,168	105,954	1.51	964,181	151,402	2,281,873	15 07
Leeds .....	78,762	159,099	2.02	1,447,801	157,295	2,752,533	17 50
Lennox and Add'ton	86,515	150,536	1.74	1,369,878	177,184	2,642,858	14 92
Lincoln .....	42,347	67,755	1.60	616,571	103,580	1,669,529	16 12
Manitoulin .....	19,396	17,262	.89	157,084	33,034	374,635	11 34
Middlesex .....	112,839	178,286	1.58	1,622,403	339,123	5,879,104	17 34
Muskoka .....	26,772	36,945	1.38	336,200	43,704	600,884	13 75
Nipissing .....	15,591	19,801	1.27	180,189	27,120	375,754	13 86
Norfolk .....	48,130	69,789	1.45	635,080	187,759	2,901,375	15 45
Northumberland .....	62,417	107,981	1.73	982,627	215,045	3,275,723	15 23
Ontario .....	63,007	124,754	1.98	1,135,261	259,303	4,340,969	16 74
Oxford .....	72,160	127,723	1.77	1,162,279	247,390	4,631,606	18 72
Parry Sound .....	28,944	38,785	1.34	352,943	51,857	760,158	14 66
Peel .....	48,493	87,772	1.81	798,725	174,950	2,808,452	16 05
Perth .....	86,401	140,834	1.63	1,281,589	290,601	5,062,522	17 42
Peterborough .....	49,782	70,193	1.41	638,756	156,034	2,351,126	15 07
Prescott .....	59,243	63,390	1.07	576,849	118,989	1,467,663	12 33
Prince Edward .....	43,865	81,589	1.86	742,460	117,981	1,804,895	15 30
Renfrew .....	84,510	80,285	.95	730,594	203,552	2,471,616	12 14
Russell .....	39,254	42,394	1.08	385,785	81,804	1,032,849	12 63
Simcoe .....	103,462	171,747	1.66	1,562,898	430,516	7,112,331	16 52
Stormont .....	40,979	63,927	1.56	581,736	84,643	1,385,788	16 37
Victoria .....	48,117	75,063	1.56	683,073	189,623	2,842,992	14 99
Waterloo .....	48,960	90,576	1.85	824,242	186,955	3,394,807	18 16
Welland .....	55,592	73,937	1.33	672,827	127,441	1,884,087	14 78
Wellington .....	102,238	159,491	1.56	1,451,368	330,907	5,526,141	16 70
Wentworth .....	47,316	79,491	1.68	723,368	151,874	2,585,918	17 03
York .....	83,164	153,022	1.84	1,392,500	328,531	5,595,094	17 03
The Province :							
1906 .....	3,069,917	4,684,625	1.53	42,630,087	8,962,925	144,570,075	16 13
1905 .....	3,020,365	5,847,494	1.94	45,142,654	8,897,898	142,804,431	16 05
1904 .....	2,926,207	5,259,189	1.80	41,915,736	8,673,525	134,304,690	15 48
1903 .....	2,783,565	4,336,562	1.56	34,432,302	8,731,405	136,657,807	15 65
1902 .....	2,646,202	4,955,438	1.87	40,386,820	8,677,988	146,421,171	16 87
1901 .....	2,557,263	4,632,317	1.81	37,012,213	8,667,512	128,325,648	14 81
1900 .....	2,526,566	3,133,045	1.24	26,568,222	8,794,953	114,758,761	13 05
1899 .....	2,505,422	3,498,705	1.40	27,010,003	8,753,926	105,771,321	12 08
1898 .....	2,453,503	4,399,063	1.79	27,362,172	8,835,272	110,528,947	12 51
1897 .....	2,341,488	3,811,518	1.63	27,366,699	8,701,705	106,952,471	12 29
1882-1906 .....	2,502,362	3,704,761	1.48	32,649,207	8,162,710	117,124,515	14 35



## RATIOS OF AREAS UNDER CROP.

TABLE XVI.—Showing by County Municipalities of Ontario the number of acres under the various crops in 1906 per 1,000 acres of cleared land; together with the average for the Province for the past ten years, and the average of the twenty-five years, 1882-1906.

Counties and Districts.														
Fall wheat.	Spring wheat.	Barley.	Oats.	Pears.	Beans.	Rye.	Buckwheat.	Corn.	Potatoes.	Carrots.	Mangel-Wurzels.	Turnips.	Hay and Clover.	Total.
Algoma.....	4.4	8.8	27.4	215.2	40.5	2	1.7	1.2	1.0	21.5	1.5	9	430.7	767.8
Brant.....	127.0	1.2	72.0	165.6	32.4	3.5	20.1	11.1	46.6	13.3	.2	9.7	189.7	708.4
Bruce.....	59.4	2.6	43.3	186.4	52.8	.2	1.2	2.3	7.9	6.1	.4	6.6	219.5	602.4
Carleton.....	1.8	17.9	27.0	236.2	7.3	.9	1.3	6.1	28.8	10.7	.6	3.9	238.9	588.5
Dufferin.....	15.2	18.7	72.5	285.0	34.3	.9	10.8	13.4	.9	8.7	.2	2.2	190.5	670.5
Dundas.....	2.0	3.4	25.1	224.1	2.1	.9	.8	6.9	44.1	11.9	.4	.9	294.1	617.3
Durham.....	25.9	36.6	100.1	195.6	58.0	1.6	11.8	15.9	15.0	8.4	.3	7.0	167.8	604.1
Elgin.....	79.4	.3	46.7	138.1	17.9	17.4	8.0	7.4	80.7	8.0	.3	2.8	196.6	604.2
Essex.....	56.4	2.3	35.6	230.1	4.5	.8	4.4	4.2	232.1	9.7	.3	2.2	157.1	739.9
Frontenac.....	1.6	14.3	27.6	160.3	3.8	1.2	5.5	4.2	19.3	12.4	.6	1.8	281.2	535.3
Glengarry.....	.3	17.9	35.5	196.5	3.3	.9	.6	4.8	25.7	10.2	.3	1.1	299.9	598.4
Grenville.....	.9	6.6	17.7	187.5	2.4	.6	2.4	16.1	38.4	14.9	.7	1.2	270.7	561.4
Grey.....	38.7	7.5	50.9	210.2	45.1	.2	.4	4.9	5.8	7.4	.2	5.6	219.0	612.1
Haldimand.....	129.0	1.7	35.1	152.0	60.0	1.8	7.0	3.3	20.0	5.4	.1	2.1	284.2	702.1
Haliburton.....	.7	15.6	14.9	164.1	28.8	.3	.1	9.9	4.0	14.8	.5	.6	353.1	612.7
Halton.....	139.5	4.6	64.4	152.3	48.4	.2	2.0	1.7	22.1	8.3	.3	9.8	201.3	661.8
Hastings.....	19.2	9.8	62.1	162.4	21.1	.5	11.4	10.7	30.3	10.7	.4	1.9	254.3	598.9
Huron.....	55.0	2.5	52.1	191.3	30.7	.6	.6	2.8	13.6	5.3	.2	8.4	190.1	566.0
Kent.....	128.8	3.1	55.9	163.2	5.6	67.1	1.8	1.8	145.2	6.9	.2	2.0	162.1	744.0
Lambton.....	75.6	1.4	53.8	188.8	8.0	2.0	1.2	1.0	54.5	6.4	.3	3.4	207.2	604.1
Lanark.....	6.2	23.0	21.7	151.2	9.6	.7	.8	8.7	20.6	6.9	.3	1.9	220.2	475.2
Leeds.....	4.2	8.2	24.6	194.5	3.7	.8	1.7	9.9	32.9	10.9	.6	1.6	296.6	592.3
Lennox and Addington.....	5.7	12.8	50.9	174.5	21.4	1.1	11.3	23.2	16.8	11.8	.3	1.0	316.4	648.0
Lincoln.....	102.5	1.0	17.9	141.9	26.8	2.3	9.1	2.2	54.1	12.2	.8	3.2	259.5	634.7
Manitowlin.....	13.1	13.6	43.8	152.7	68.9	.3	1.5	.7	3.0	12.0	.9	1.1	455.4	775.6
Middlesex.....	73.6	.4	42.0	156.5	12.7	1.2	1.1	1.1	41.6	7.9	.3	4.5	172.6	518.9
Muskoka.....	1.1	9.6	10.8	174.9	30.4	.3	2.1	2.5	5.1	17.0	.1	.8	418.3	682.9
Nipissing.....	.8	10.5	13.5	163.0	32.7	.2	.4	.9	2.4	23.9	.9	.4	345.6	601.1

Norfolk	133.0	7	36.6	139.8	40.3	8.4	36.9	32.2	71.6	10.4	.5	3.1	4.3	178.5	696.3
Northumberland	49.7	23.2	59.8	163.2	49.4	1	21.0	23.4	24.9	12.2	.4	4.0	14.1	182.7	629.6
Ontario	32.9	40.9	85.9	233.1	40.6	.6	12.4	16.1	20.6	9.5	.1	10.1	31.5	171.5	705.8
Oxford	79.4	.5	56.1	203.8	18.0	.2	3.8	3.8	50.2	6.8	.1	9.0	14.7	183.9	630.3
Parry Sound	.2	8.0	17.3	204.6	41.7	.3	2.5	1.2	2.7	17.0	1.1	.8	14.0	393.3	704.7
Peel	91.3	4.4	112.2	193.0	41.0	.3	4.2	2.9	13.4	11.2	.2	4.9	7.3	186.5	672.8
Perth	80.5	1.8	66.6	233.9	26.2	.0	.3	.7	18.2	6.7	.2	10.6	11.7	193.6	651.0
Peterborough	47.3	21.4	38.5	200.5	57.2	.3	7.3	6.5	9.1	10.3	.5	5.4	8.8	193.5	606.6
Prescott	.....	20.7	23.4	206.0	4.1	.5	.2	5.8	26.0	14.0	.6	1.0	1.2	300.9	604.4
Prince Edward	12.5	5.5	84.3	127.3	40.1	2.0	28.1	23.0	48.5	10.2	.4	1.7	.7	227.4	611.7
Renfrew	1.7	85.5	12.4	161.7	47.9	.9	3.7	2.1	6.9	9.8	.4	1.5	2.3	239.1	575.9
Russell	2.2	13.9	32.7	242.7	7.1	1.4	.....	7.2	25.7	10.1	1.2	2.7	4.8	324.4	676.1
Simcoe	115.2	15.1	97.1	183.9	48.2	1.0	8.0	9.8	7.3	11.3	.4	4.6	14.9	163.5	680.3
Stormont	.5	7.7	24.8	193.8	1.8	1.3	.1	9.9	33.1	12.0	.5	.8	.9	269.6	556.8
Victoria	34.7	34.1	60.2	251.7	47.6	1.0	4.8	24.9	8.5	8.7	.2	6.1	18.2	170.3	671.0
Waterloo	128.9	.5	83.2	240.9	27.2	.1	7.1	1.9	19.0	11.3	.4	9.2	19.4	194.8	743.9
Welland	106.9	1.3	12.0	159.4	16.3	9.6	8.9	10.8	44.1	15.4	.3	1.7	1.0	300.1	687.8
Wellington	24.4	10.6	72.6	262.5	36.7	.2	.4	4.3	5.5	8.3	.2	9.1	27.4	206.7	668.9
Wentworth	138.9	1.2	63.0	172.5	38.3	.5	7.8	7.2	32.4	16.0	.2	10.0	9.2	225.0	722.2
York	82.1	28.5	101.3	231.3	41.5	.6	4.7	4.8	20.2	14.0	.3	11.9	17.4	189.4	748.0
The Province :															
1906	55.8	12.2	53.6	192.6	29.1	3.6	5.7	7.5	33.3	9.7	.4	4.9	9.4	217.6	635.4
1905	57.2	13.6	55.5	191.5	26.9	3.6	7.3	7.3	34.4	9.5	.4	5.0	9.7	216.8	638.7
1904	43.8	16.3	55.9	192.2	24.6	3.7	9.5	7.3	37.9	9.7	.5	5.2	9.6	211.9	628.1
1903	48.8	18.2	52.0	193.4	29.9	3.9	13.1	7.0	43.2	10.2	.6	5.9	9.9	204.0	640.1
1902	55.2	22.3	48.8	184.3	39.2	4.0	13.9	6.9	42.9	10.7	.6	5.6	10.1	195.0	639.5
1901	67.8	26.6	47.4	179.3	44.9	4.0	11.8	6.6	38.8	11.5	.7	4.5	10.9	190.3	645.1
1900	80.4	28.3	43.4	180.4	49.8	3.3	10.7	7.7	38.4	12.3	.8	4.1	11.8	190.0	661.4
1899	80.1	30.4	37.4	180.3	56.7	3.1	10.5	10.1	38.6	12.8	.9	4.0	11.7	191.1	667.7
1898	80.7	30.0	33.8	182.9	66.6	3.4	12.7	11.5	40.1	13.1	1.0	3.7	11.7	188.8	680.0
1897	73.9	25.2	35.1	189.3	69.8	3.9	14.6	11.8	42.3	13.2	.9	3.2	11.6	182.2	677.0
1882-1906	71.5	33.7	52.4	171.8	53.6	3.4	9.8	8.2	29.7	12.7	.8	3.1	10.4	203.9	665.0



## PASTURE—ORCHARD—VINEYARD—APPLES.

TABLE XVII. Showing by County Municipalities of Ontario the area in pasture (cleared land), orchard and garden, and vineyard, for the year 1906, together with the totals for the Province for the past ten years; also the number of apple trees and the yield.

Counties and Districts.	Pasture.	Orch'd & Garden.	Vine-yards.	Apple Trees 15 Years old and over.			No. of trees under 15 years in Orchards.
				No. of Trees.	Bushels.	Bush. per tree.	
Algoma .....	14,530	921	5	5,537	17,885	3.23	21,945
Brant .....	29,904	6,041	60	109,829	761,115	6.93	31,856
Bruce .....	158,660	10,167	72	244,904	1,302,889	5.32	70,233
Carleton .....	99,109	2,742	38	52,181	278,125	5.33	71,869
Dufferin .....	49,501	3,060	23	55,798	320,281	5.74	32,860
Dundas .....	48,016	2,772	66	71,306	287,363	4.03	30,536
Durham .....	52,989	8,791	84	201,504	731,460	3.63	182,725
Elgin .....	95,324	10,494	53	205,864	1,091,079	5.30	61,931
Essex .....	39,931	12,503	1,555	168,330	887,099	5.27	67,071
Frontenac .....	83,977	4,733	51	101,334	575,577	5.68	44,210
Glenarry .....	55,208	2,049	41	49,185	221,824	4.51	17,119
Grenville .....	60,852	3,059	44	69,047	140,856	2.04	47,807
Grey .....	171,356	15,344	62	315,529	1,719,633	5.45	197,669
Haldimand .....	40,375	6,851	71	137,820	815,894	5.92	29,407
Haliburton .....	9,632	497	13	6,648	34,570	5.20	9,761
Halton .....	31,260	8,292	322	156,388	724,076	4.63	37,874
Hastings .....	115,753	10,737	92	210,622	1,156,315	5.49	166,193
Huron .....	206,508	13,681	52	324,881	1,725,118	5.31	90,854
Kent .....	78,463	15,728	214	315,221	1,654,910	5.25	91,265
Lambton .....	123,236	11,872	159	268,025	1,214,153	4.53	69,379
Lanark .....	112,373	2,613	14	62,477	221,169	3.54	33,319
Leeds .....	97,227	3,686	66	79,274	319,474	4.03	40,085
Lennox & Addington	82,443	7,057	.....	108,530	454,741	4.19	104,815
Lincoln .....	24,301	16,081	4,554	190,945	1,094,115	5.73	17,840
Manitoulin .....	7,599	526	.....	4,534	19,315	4.26	13,592
Middlesex .....	235,442	16,516	150	385,503	2,135,687	5.54	88,129
Muskoka .....	14,382	963	7	6,085	25,557	4.20	19,142
Nipissing .....	7,614	248	4	432	864	2.00	3,041
Norfolk .....	43,025	10,216	240	178,984	1,297,634	7.25	31,500
Northumberland .....	74,942	19,086	91	450,136	1,584,479	3.52	379,113
Ontario .....	57,175	9,933	30	220,665	684,062	3.10	130,539
Oxford .....	98,705	10,478	60	184,777	1,395,066	7.55	52,926
Parry Sound .....	13,548	524	31	2,186	11,039	5.05	8,336
Peel .....	56,191	6,824	141	136,343	616,270	4.52	39,118
Perth .....	109,110	7,754	63	159,274	954,051	5.99	38,921
Peterborough .....	67,124	3,627	24	70,328	410,716	5.84	36,982
Prescott .....	50,612	2,111	35	37,656	208,991	5.55	48,321
Prince Edward .....	44,427	12,610	7	230,946	1,032,329	4.47	208,588
Renfrew .....	93,860	2,035	31	26,712	102,841	3.85	35,820
Russell .....	29,228	1,116	30	14,727	55,226	3.75	17,655
Simcoe .....	107,874	12,716	130	220,354	1,172,283	5.32	158,960
Stormont .....	50,367	2,428	.....	59,128	235,921	3.99	26,653
Victoria .....	56,486	3,872	45	79,441	376,550	4.74	40,111
Waterloo .....	33,495	5,704	21	113,237	621,671	5.49	28,472
Welland .....	36,985	9,450	1,687	199,329	1,209,927	6.07	14,513
Wellington .....	94,408	7,238	90	156,028	811,346	5.20	42,187
Wentworth .....	31,293	14,583	2,133	208,150	1,128,173	5.42	37,226
York .....	54,281	11,977	24	242,676	1,167,272	4.81	122,368
The Province:							
1906 .....	3,349,101	352,306	12,785	6,898,810	35,006,991	5.07	3,190,836
1905 .....	3,291,235	366,613	13,719	7,018,723	31,380,749	4.47	3,183,043
1904 .....	3,183,973	369,495	14,357	7,103,566	49,687,423	6.99	3,329,379
1903 .....	3,057,576	365,851	15,269	7,095,554	43,659,413	6.15	3,456,053
1902 .....	2,879,972	356,251	14,028	7,024,890	47,648,743	6.78	3,446,904
1901 .....	2,777,983	346,915	12,227	6,777,935	14,430,650	2.13	3,392,701
1900 .....	2,694,600	339,411	10,687	6,518,048	36,993,017	5.68	3,430,670
1899 .....	2,710,268	338,073	10,802	6,324,842	19,126,439	3.02	3,445,135
1898 .....	2,708,043	335,420	10,118	6,221,324	*	.....	3,458,820
1897 .....	2,658,245	326,341	11,100	6,102,399	13,343,720	2.19	3,435,018

\* No estimate made.

HORSES.

TABLE XVIII. Showing by County Municipalities of Ontario the number and value of horses on hand on July 1, 1906, together with the totals for the Province for the past ten years; also the number and value of horses sold during the year ending June 30.

Counties and Districts.	On hand July 1			Total.		Sold in year.	
	Working horses.	Breeding mares.	Other horses.			No.	Value.
				No.	Value.		
Algoma .....	2,790	613	779	4,182	\$529,070	379	\$46,617
Brant .....	5,962	1,305	2,087	9,354	1,037,267	642	71,904
Bruce .....	12,618	4,580	6,658	23,856	2,896,717	2,860	383,240
Carleton .....	8,360	2,435	3,529	14,324	1,675,118	1,480	180,560
Dufferin .....	6,700	2,345	3,032	12,077	1,391,961	1,281	160,125
Dundas .....	5,203	1,338	2,012	8,553	850,890	816	89,760
Durham .....	8,951	2,234	3,305	14,490	1,835,330	1,513	189,125
Elgin .....	10,101	2,786	4,390	17,277	1,848,920	1,822	209,530
Essex .....	11,365	3,469	5,768	20,602	2,209,969	1,831	219,720
Frontenac .....	7,136	1,931	3,004	12,071	1,217,577	889	88,890
Glengarry .....	5,722	2,166	2,915	10,803	1,117,551	1,007	116,812
Grenville .....	4,913	963	1,748	7,624	735,852	656	66,912
Grey .....	17,056	5,871	7,855	30,782	3,676,034	2,970	347,490
Haldimand .....	6,553	1,889	2,677	11,119	1,212,378	868	102,424
Haliburton .....	1,090	375	536	2,001	200,870	230	23,460
Halton .....	5,679	1,239	1,723	8,641	1,054,833	682	84,568
Hastings .....	12,114	2,351	4,104	18,569	1,920,737	1,440	142,560
Huron .....	15,736	6,109	8,037	29,882	3,952,518	3,876	546,516
Kent .....	15,838	3,595	6,351	25,784	2,663,274	1,966	218,226
Lambton .....	11,866	3,843	6,583	22,292	2,501,350	2,403	281,151
Lanark .....	6,898	1,500	2,641	11,039	1,240,934	1,145	135,110
Leeds .....	7,736	1,473	2,805	12,014	1,085,631	1,232	117,040
Lennox & Addington	8,182	1,731	3,081	12,994	1,314,407	907	88,886
Lincoln .....	6,186	1,291	1,907	9,384	1,044,345	708	81,420
Manitoulin .....	1,284	461	674	2,419	270,337	239	25,095
Middlesex .....	17,390	5,756	8,808	31,954	3,769,548	3,682	474,978
Muskoka .....	2,125	559	663	3,347	388,618	384	37,248
Nipissing .....	1,564	310	580	2,454	314,560	177	21,240
Norfolk .....	8,373	1,989	3,651	14,013	1,438,325	1,189	122,467
Northumberland .....	10,501	2,499	4,626	17,626	2,082,649	1,621	179,931
Ontario .....	11,462	3,530	4,751	19,743	2,502,190	1,798	240,932
Oxford .....	12,237	3,211	4,278	19,726	2,301,884	1,582	200,914
Parry Sound .....	2,179	538	771	3,488	408,364	401	45,313
Peel .....	7,445	2,543	3,315	13,303	1,643,433	1,390	183,480
Perth .....	12,505	4,566	5,941	23,012	3,025,918	2,768	379,216
Peterborough .....	7,211	1,609	2,401	11,221	1,261,010	916	108,088
Prescott .....	5,051	1,704	2,263	9,018	987,298	753	83,583
Prince Edward .....	6,169	1,225	2,230	9,624	978,802	692	71,968
Renfrew .....	8,104	2,293	3,193	13,590	1,635,017	1,373	155,149
Russell .....	3,300	1,387	1,335	6,022	631,594	390	45,240
Simcoe .....	18,369	5,886	7,778	32,033	4,131,438	2,731	371,416
Stormont .....	4,406	1,186	1,856	7,448	720,686	573	57,873
Victoria .....	7,718	2,800	4,055	14,573	1,804,761	1,440	171,360
Waterloo .....	8,695	2,190	2,551	13,436	1,606,731	1,245	148,155
Welland .....	6,942	1,138	2,196	10,276	1,144,243	764	91,680
Wellington .....	13,784	4,151	5,517	23,452	2,787,508	1,962	253,098
Wentworth .....	8,020	1,530	2,723	12,373	1,457,408	745	86,420
York .....	14,788	4,324	5,170	24,282	3,309,098	2,343	304,590
The Province :							
1906 .....	404,377	114,917	168,853	688,147	79,814,953	64,761	7,851,480
1905 .....	403,246	107,774	161,791	672,781	73,911,177	62,588	7,419,783
1904 .....	399,262	102,658	153,634	655,554	68,138,228	63,310	6,836,499
1903 .....	392,619	98,485	148,477	639,581	61,811,456	61,967	6,448,523
1902 .....	393,307	93,425	139,374	626,106	55,173,637	54,538	5,079,127
1901 .....	398,358	90,148	131,837	620,343	50,038,465	50,755	4,347,582
1900 .....	405,883	90,136	121,290	617,309	46,916,999	47,926	3,774,480
1899 .....	418,490	86,614	110,420	615,524	42,713,557	45,367	3,204,006
1898 .....	430,504	77,886	102,851	611,241	38,659,896	44,404	2,884,107
1897 .....	436,921	69,940	106,809	613,670	36,111,805	43,511	2,700,479



## CATTLE.

TABLE XIX. Showing by County Municipalities of Ontario the number and value of cattle on hand on July 1, 1906, together with the totals for the Province for the past ten years; and also the number and value of cattle sold or slaughtered during the year ending June 30.

Counties and Districts.	On hand July 1.					Sold or slaughtered in year.	
	Milch cows.	Store cattle over 2 years.	Young and other cattle.	Total.		No.	Value.
				No.	Value.		
Algoma .....	6,857	3,611	10,526	20,994	\$478,312	4,482	\$125,630
Brant .....	13,505	4,144	16,194	33,843	940,497	9,078	320,453
Bruce .....	31,153	30,066	56,460	117,679	3,351,762	34,530	1,427,477
Carleton .....	38,100	14,155	32,757	85,012	2,141,249	18,283	614,499
Dufferin .....	13,909	12,539	23,359	49,807	1,283,408	12,102	481,660
Dundas .....	29,063	2,261	12,931	44,255	1,231,891	5,051	130,063
Durham .....	16,621	7,848	25,141	49,610	1,376,142	13,277	479,300
Elgin .....	28,126	16,912	33,917	78,955	2,379,369	24,458	917,175
Essex .....	19,703	9,134	26,553	55,390	1,394,983	14,114	387,429
Frontenac .....	34,041	7,515	20,143	61,699	1,587,525	10,636	296,213
Glengarry .....	32,081	3,844	15,882	51,807	1,296,365	6,313	159,845
Grenville .....	21,876	3,488	10,461	35,825	872,845	5,820	158,071
Grey .....	40,937	36,031	72,607	149,575	4,007,055	39,257	1,555,362
Haldimand .....	14,293	5,029	21,692	41,014	1,025,998	10,960	381,737
Haliburton .....	3,907	1,760	5,670	11,337	198,246	2,861	52,127
Halton .....	11,496	7,680	15,575	34,751	1,038,388	10,349	460,427
Hastings .....	50,980	7,946	36,367	95,293	2,108,885	15,136	412,456
Huron .....	33,839	44,622	66,280	144,741	4,745,995	46,634	2,116,717
Kent .....	24,264	24,146	39,248	87,658	2,568,431	23,355	853,158
Lambton .....	27,579	21,418	52,189	101,186	2,842,270	28,628	1,123,649
Lanark .....	28,870	11,783	28,984	69,637	1,610,999	15,704	534,250
Leeds .....	39,866	5,543	19,887	65,296	1,623,137	8,217	215,778
Lennox and Add. ..	28,513	5,929	21,603	56,045	1,315,321	9,154	264,551
Lincoln .....	10,141	2,759	9,703	22,603	619,991	5,538	199,645
Manitoulin .....	3,978	2,927	7,837	14,742	331,382	3,255	104,095
Middlesex .....	44,796	43,550	64,598	152,944	5,111,992	48,750	2,089,425
Muskoka .....	5,958	2,621	8,811	17,390	358,233	3,628	103,108
Nipissing .....	3,550	1,195	4,374	9,119	209,695	2,171	56,533
Norfolk .....	19,802	4,324	18,693	42,819	1,098,334	11,437	300,450
Northumberland ..	28,499	6,846	25,277	60,622	1,593,006	12,848	343,042
Ontario .....	23,766	13,617	38,272	75,655	2,180,327	18,790	784,107
Oxford .....	44,532	15,332	35,848	95,712	3,169,426	24,934	915,078
Parry Sound .....	6,373	3,096	10,268	19,737	407,829	4,977	129,999
Peel .....	15,942	14,228	19,499	49,669	1,516,747	17,256	739,074
Perth .....	34,349	23,397	53,517	111,263	3,157,140	30,296	1,180,332
Peterborough .....	23,161	8,878	25,118	57,157	1,203,966	11,359	295,334
Prescott .....	25,704	3,781	14,462	43,947	923,160	6,001	144,024
Prince Edward .....	18,025	2,259	9,964	30,248	817,904	5,274	128,844
Renfrew .....	28,229	19,271	36,822	84,322	1,739,408	15,862	413,046
Russell .....	18,065	3,497	10,742	32,304	777,577	4,958	114,034
Simcoe .....	35,642	24,759	56,730	117,131	2,854,494	29,191	1,063,136
Stormont .....	27,091	1,738	11,488	40,317	1,061,675	4,429	111,611
Victoria .....	19,584	14,757	32,387	66,728	1,526,084	15,234	480,480
Waterloo .....	16,225	5,881	21,812	43,918	1,265,482	20,089	808,381
Welland .....	11,389	3,823	13,378	28,590	733,041	8,851	279,515
Wellington .....	28,301	22,256	48,158	98,715	2,997,866	32,027	1,556,512
Wentworth .....	15,761	4,393	17,406	37,560	1,087,618	11,051	414,634
York .....	30,605	13,095	25,297	68,997	2,141,826	24,871	982,653
The Province .....							
1906 .....	1,129,047	549,684	1,284,887	2,963,618	80,303,276	741,476	27,205,105
1905 .....	1,106,984	533,903	1,248,616	2,889,503	76,764,482	714,007	25,871,468
1904 .....	1,078,992	504,954	1,192,358	2,776,304	72,821,003	730,212	26,342,872
1903 .....	1,050,108	484,276	1,139,877	2,674,261	69,289,924	719,911	25,867,813
1902 .....	1,010,746	458,834	1,093,004	2,562,584	63,517,342	673,544	23,340,908
1901 .....	984,012	445,868	1,077,740	2,507,620	59,527,119	610,880	20,286,963
1900 .....	976,124	392,665	6,060,541	2,429,330	56,320,810	560,893	18,017,989
1899 .....	974,474	356,505	987,376	2,318,355	52,938,500	555,583	17,303,426
1898 .....	965,021	345,695	905,227	2,215,943	47,286,254	552,485	16,121,559
1897 .....	940,236	365,406	876,684	2,182,326	42,683,557	503,007	13,350,223

## SHEEP.

TABLE XX. Showing by County Municipalities of Ontario the number and value of sheep on hand July 1, 1906, together with the totals for the Province for the past ten years; also the number and value of sheep sold or slaughtered during the year ending June 30.

Counties and Districts.	On hand July 1.				Sold or slaughtered in year.	
	Over 1 Year.	Under 1 Year.	Total.		No.	Value.
			No.	Value.		
Algoma .....	9,792	7,817	17,609	\$79,197	6,286	\$27,596
Brant .....	9,106	7,107	16,213	99,289	6,489	31,017
Bruce .....	40,658	37,277	77,935	448,965	35,431	173,258
Carleton .....	9,837	9,357	19,194	88,153	8,553	31,903
Dufferin .....	17,685	17,600	35,285	169,634	15,514	74,777
Dundas .....	2,241	2,460	4,701	23,785	2,202	8,764
Durham .....	16,897	14,147	31,044	168,725	11,738	55,169
Elgin .....	15,089	14,640	29,729	170,807	13,805	67,921
Essex .....	5,534	5,744	11,278	53,865	3,636	13,417
Frontenac .....	14,395	13,609	28,004	130,504	15,767	62,280
Glengarry .....	4,862	3,978	8,840	45,186	3,180	14,246
Grenville .....	2,921	2,688	5,609	28,288	3,936	15,744
Grey .....	53,876	52,516	106,392	523,813	47,726	199,972
Haldimand .....	8,337	8,426	16,763	91,926	7,882	37,755
Haliburton .....	5,440	4,223	9,663	39,001	4,419	15,157
Halton .....	7,516	7,060	14,576	83,287	6,867	33,923
Hastings .....	22,780	19,816	42,596	173,461	16,942	64,210
Huron .....	24,359	23,755	48,114	299,447	19,253	93,185
Kent .....	12,366	11,249	23,615	115,018	11,769	56,727
Lambton .....	19,068	18,478	37,546	214,410	17,801	85,089
Lanark .....	20,374	19,561	39,935	190,651	16,876	64,466
Leeds .....	7,222	7,330	14,552	65,690	6,232	25,364
Lennox and Addington .....	10,043	8,399	18,442	93,315	9,008	37,383
Lincoln .....	7,195	6,318	13,513	83,745	5,451	27,637
Manitoulin .....	10,951	9,453	20,404	85,849	8,395	33,328
Middlesex .....	22,426	21,136	43,562	288,379	21,223	117,363
Muskoka .....	11,877	9,664	21,341	93,094	9,016	32,638
Nipissing .....	2,943	2,199	5,142	22,855	1,683	6,732
Norfolk .....	8,163	7,501	15,664	79,796	7,933	37,682
Northumberland .....	11,368	10,312	21,680	115,344	7,406	31,401
Ontario .....	22,479	19,876	42,355	242,301	17,689	85,261
Oxford .....	6,350	5,686	12,036	67,773	7,053	34,630
Parry Sound .....	11,735	10,110	21,845	100,016	10,493	39,873
Peel .....	6,521	6,768	13,289	78,751	8,436	41,674
Perth .....	8,846	8,335	17,181	96,682	8,030	39,588
Peterborough .....	12,569	11,635	24,204	103,773	9,941	37,179
Prescott .....	6,086	4,778	10,864	43,011	5,730	19,081
Prince Edward .....	3,500	3,568	7,068	32,176	3,448	13,447
Renfrew .....	33,126	28,917	62,043	227,936	22,585	82,435
Russell .....	4,107	4,058	8,165	38,055	4,265	17,145
Simcoe .....	49,686	41,289	90,975	419,667	31,813	147,294
Stormont .....	4,062	3,853	7,915	36,510	3,973	17,680
Victoria .....	23,281	18,843	42,124	201,401	17,857	72,857
Waterloo .....	6,526	6,202	12,728	70,020	6,818	34,704
Welland .....	5,746	5,322	11,068	54,497	5,180	25,071
Wellington .....	36,834	34,321	71,155	414,878	33,187	167,926
Wentworth .....	9,116	8,487	17,603	113,741	8,523	44,831
York .....	18,673	14,577	33,250	214,452	16,976	99,649
The Province :						
1906 .....	684,364	620,445	1,304,809	6,721,119	574,416	2,596,429
1905 .....	701,312	622,841	1,324,153	6,191,774	603,736	2,584,209
1904 .....	772,730	682,752	1,455,482	6,425,100	687,144	2,896,391
1903 .....	860,718	781,909	1,642,627	7,228,498	727,850	3,074,393
1902 .....	915,217	800,296	1,715,513	7,634,284	732,994	3,110,882
1901 .....	947,614	814,185	1,761,799	7,772,793	729,148	3,103,513
1900 .....	949,597	847,616	1,797,213	7,711,496	790,058	2,872,609
1899 .....	930,314	842,290	1,772,604	7,315,729	665,238	2,629,201
1898 .....	877,872	799,142	1,677,014	6,499,695	664,239	2,460,379
1897 .....	897,685	792,265	1,690,350	6,003,194	732,872	2,538,171



## SWINE.

TABLE XXI. Showing by County Municipalities of Ontario the number and value of swine on hand July 1, 1906, together with the totals for the Province for the past ten years; also the number and value of the swine sold or slaughtered during the year ending June 30.

Counties and Districts.	On hand July 1.				Sold or slaughtered in year.	
	Over 1 year.	Under 1 year.	Total.		No.	Value.
			No.	Value.		
Algoma .....	1,419	5,086	6,505	\$ 46,274	7,029	\$ 82,520
Brant .....	4,624	28,006	32,630	223,615	41,866	432,894
Bruce .....	7,329	47,643	54,972	387,288	74,224	734,075
Carleton .....	4,484	24,705	29,189	206,320	29,624	290,315
Dufferin .....	3,879	30,336	34,215	230,184	45,481	445,259
Dundas .....	3,883	21,800	25,633	188,940	32,828	317,775
Durham .....	4,938	31,085	36,023	253,232	49,711	516,000
Elgin .....	8,527	59,489	68,016	449,108	77,521	778,311
Essex .....	17,421	90,436	107,857	705,115	100,710	995,015
Frontenac .....	3,506	17,643	21,149	160,740	25,354	263,175
Glengarry .....	4,322	15,473	19,795	147,112	20,715	203,421
Grenville .....	2,730	14,379	17,109	127,995	19,927	192,296
Grey .....	10,116	71,472	81,588	597,400	109,986	1,117,458
Haldimand .....	3,223	21,716	24,939	168,931	32,038	307,885
Haliburton .....	587	1,901	2,488	15,740	2,615	24,136
Halton .....	2,695	18,925	21,620	162,160	30,035	308,760
Hastings .....	7,941	41,153	49,094	390,246	58,651	600,586
Huron .....	8,434	64,155	72,589	513,866	96,435	990,387
Kent .....	13,937	90,652	104,589	676,186	111,530	1,108,608
Lambton .....	7,553	47,899	55,452	393,332	68,297	678,189
Lanark .....	3,542	19,024	22,566	150,985	25,353	257,333
Leeds .....	4,665	25,175	29,840	215,061	36,103	358,864
Lennox and Addington .....	3,199	17,492	20,691	151,953	28,912	297,794
Lincoln .....	2,520	16,287	18,807	141,093	24,291	253,112
Manitoulin .....	922	3,746	4,668	26,462	5,346	52,177
Middlesex .....	8,193	54,053	62,246	449,170	80,319	791,945
Muskoka .....	843	2,973	3,816	27,400	4,691	44,236
Nipissing .....	1,330	3,021	4,351	33,447	3,611	41,888
Norfolk .....	5,208	36,448	41,656	270,931	51,250	493,025
Northumberland .....	5,753	36,700	42,453	294,380	56,737	591,767
Ontario .....	6,213	48,502	54,715	391,153	65,027	658,073
Oxford .....	7,905	59,152	67,057	503,998	86,272	920,522
Parry Sound .....	1,114	3,999	5,113	37,289	6,730	66,560
Peel .....	4,291	23,952	28,243	198,998	40,566	423,103
Perth .....	7,598	62,986	70,584	514,960	89,533	923,085
Peterborough .....	4,173	22,947	27,120	171,947	37,227	358,124
Prescott .....	4,031	12,283	16,314	126,072	11,356	129,458
Prince Edward .....	3,475	16,710	20,185	151,550	24,832	239,877
Renfrew .....	7,048	17,706	24,754	166,113	18,746	195,333
Russell .....	2,368	9,668	12,036	79,919	11,252	114,770
Simcoe .....	12,592	79,779	92,371	605,487	110,881	1,146,510
Stormont .....	2,882	15,483	18,365	126,822	21,563	213,456
Victoria .....	5,121	28,085	33,206	231,059	43,450	431,893
Waterloo .....	5,109	41,972	47,081	350,935	62,779	656,668
Welland .....	2,321	14,323	16,644	122,431	20,778	201,131
Wellington .....	8,365	65,651	74,016	511,708	95,686	964,515
Wentworth .....	3,697	25,137	28,834	215,312	41,265	419,252
York .....	8,375	58,219	66,594	460,289	83,605	869,492
The Province:						
1906 .....	254,351	1,565,427	1,819,778	12,770,708	2,222,758	22,501,028
1905 .....	266,460	1,640,000	1,906,460	12,280,667	2,267,583	22,202,233
1904 .....	279,502	1,729,482	2,008,984	12,921,743	2,240,083	22,665,164
1903 .....	267,796	1,709,590	1,977,386	13,023,743	2,168,598	22,532,862
1902 .....	238,992	1,445,643	1,684,635	11,262,265	1,991,907	20,154,190
1901 .....	222,916	1,263,969	1,491,885	9,298,712	1,973,405	17,548,490
1900 .....	265,457	1,506,184	1,771,641	9,598,153	2,056,049	15,800,799
1899 .....	295,349	1,675,721	1,971,070	10,180,338	1,875,466	14,157,394
1898 .....	265,048	1,375,739	1,640,787	8,720,242	1,592,697	11,852,535
1897 .....	235,479	1,049,484	1,284,963	6,533,210	1,399,967	10,080,812

## POULTRY.

TABLE XXII. Showing by County Municipalities of Ontario the number and value of Poultry on hand July 1, 1906, together with the totals for the Province for the past ten years; also the number and value of Poultry sold or killed during the year ending June 30.

Counties and Districts.	On hand July 1.				Total value.	Sold or killed.	
	Turkeys.	Geese.	Ducks.	Other fowls.		No.	Value.
Algoma .....	3,329	1,532	894	61,700	\$23,896	21,635	\$ 8,438
Brant .....	1,946	2,475	3,394	126,096	52,169	51,127	21,985
Bruce .....	20,682	14,449	14,136	268,393	117,480	81,904	30,304
Carleton .....	16,780	11,317	7,753	222,349	101,902	109,373	48,124
Dufferin .....	12,984	8,527	6,624	118,739	55,551	49,833	17,940
Dundas .....	11,051	3,142	3,100	147,857	57,356	44,540	16,925
Durham .....	9,259	8,083	5,873	194,915	85,119	69,142	26,274
Elgin .....	25,721	5,479	7,096	252,146	104,449	109,083	44,724
Essex .....	23,584	7,517	15,514	358,936	122,485	135,563	46,091
Frontenac .....	13,293	2,234	3,086	118,118	54,671	57,509	21,278
Glengarry .....	5,347	2,364	720	124,894	43,657	47,013	15,984
Grenville .....	9,724	3,834	1,986	94,911	38,874	40,509	15,393
Grey .....	25,697	14,560	16,705	371,587	155,912	135,826	54,330
Haldimand .....	8,355	5,410	3,194	135,868	57,410	60,633	22,434
Haliburton .....	1,437	479	351	18,170	7,585	7,491	2,547
Halton .....	6,119	4,838	6,411	113,112	53,545	54,886	23,052
Hastings .....	9,218	7,957	3,139	227,833	82,300	84,664	30,479
Huron .....	31,353	13,350	21,991	414,569	160,463	139,547	57,214
Kent .....	25,367	7,917	15,748	389,144	155,735	143,213	54,421
Lambton .....	30,812	9,105	16,627	370,527	146,138	143,232	57,293
Lanark .....	8,244	7,112	2,550	143,742	54,350	43,505	17,522
Leeds .....	11,914	4,726	3,709	144,774	61,599	54,129	18,945
Lennox & Addington	6,539	2,814	2,885	155,081	59,871	58,411	20,444
Lincoln .....	3,574	1,383	5,307	132,630	53,179	65,570	27,539
Manitoulin .....	1,269	1,447	374	23,046	8,641	7,461	3,059
Middlesex .....	53,545	10,081	15,868	465,915	217,653	182,940	73,176
Muskoka .....	2,508	903	1,058	48,200	19,820	21,720	8,471
Nipissing .....	1,410	572	120	29,271	12,769	12,763	5,488
Norfolk .....	14,521	4,148	4,344	217,102	82,239	91,868	35,829
Northumberland .....	11,999	5,023	4,269	220,104	80,111	70,079	28,032
Ontario .....	8,261	11,114	8,547	251,353	105,846	100,737	43,317
Oxford .....	14,141	5,447	6,772	261,780	102,987	90,289	35,213
Parry Sound .....	2,048	1,546	528	47,028	17,882	18,368	6,612
Peel .....	13,292	6,731	11,967	163,038	80,943	93,845	42,230
Perth .....	15,032	11,230	16,813	333,716	124,512	88,193	34,395
Peterborough .....	14,810	7,309	3,070	162,738	64,851	53,881	21,552
Prescott .....	3,945	4,152	1,346	109,971	40,241	37,335	13,067
Prince Edward .....	8,068	1,729	1,934	119,796	48,336	37,618	13,919
Renfrew .....	7,533	7,057	2,387	147,420	62,101	51,415	20,052
Russell .....	3,667	1,295	853	68,613	28,070	28,535	10,558
Simcoe .....	22,613	14,114	15,792	386,501	155,123	133,447	52,044
Stormont .....	4,040	2,167	1,240	124,588	45,845	41,583	14,138
Victoria .....	8,716	7,623	6,723	199,183	76,884	74,100	28,158
Waterloo .....	2,233	3,626	5,684	163,962	56,386	47,654	17,632
Welland .....	3,954	1,875	3,808	144,530	53,307	69,971	26,589
Wellington .....	12,735	13,322	10,607	274,852	114,303	111,090	44,436
Wentworth .....	3,711	2,968	5,943	143,588	57,357	69,805	31,412
York .....	10,725	9,703	15,243	275,474	135,435	130,373	65,187
The Province :							
1906 .....	567,105	285,786	314,083	9,087,860	3,697,338	3,473,708	1,374,246
1905 .....	566,068	287,405	294,976	8,590,044	3,335,660	3,340,802	1,300,253
1904 .....	578,219	288,723	301,711	8,244,030	3,077,029	3,537,358	1,354,486
1903 .....	647,056	317,910	358,802	8,359,805	2,973,646	3,684,451	1,407,340
1902 .....	732,359	332,781	397,333	8,300,335	2,957,286	3,674,198	1,398,289
1901 .....	825,823	360,278	435,094	8,124,041	2,859,172	3,495,999	1,305,555
1900 .....	890,933	398,890	457,072	7,794,346	2,727,363	3,164,287	1,176,740
1899 .....	927,456	421,830	458,497	7,536,241	2,658,321	3,102,614	1,162,991
1898 .....	1,024,285	454,335	{ 7,605,653 }		2,578,136	3,072,767	1,131,923
1897 .....	890,228	409,715	{ 7,135,398 }		2,318,038	2,965,221	1,083,914



## WOOL—BEES.

TABLE XXIII. Showing by County Municipalities of Ontario the number, weight and value of fleeces of the wool clip in 1906, together with the totals of the Province for the past ten years; also the number of colonies of bees and the value of apiaries.

Counties and Districts.	Clip of Wool.				Colonies of Bees.		
	No.	Pounds.	Lbs. per fleece.	Value.	No.	Value, including outfit.	Value per hive.
				\$		\$	\$ c.
Algoma.....	9,757	61,520	6.31	9,843	109	654	6 00
Brant.....	9,257	67,298	7.27	10,768	4,987	32,366	6 49
Bruce.....	40,842	266,220	6.52	42,595	5,915	32,769	5 54
Carleton.....	9,527	55,792	5.86	8,927	5,163	28,500	5 52
Dufferin.....	17,668	117,368	6.64	18,779	3,926	21,986	5 60
Dundas.....	2,294	14,502	6.32	2,320	3,330	18,914	5 68
Durham.....	16,640	136,839	8.22	21,894	3,853	17,916	4 65
Elgin.....	14,983	98,379	6.57	15,741	5,737	33,504	5 84
Essex.....	5,571	37,771	6.78	6,043	7,154	36,128	5 05
Frontenac.....	14,050	85,209	6.06	13,634	6,029	33,943	5 63
Glengarry.....	4,986	29,804	5.98	4,769	4,358	20,090	4 61
Grenville.....	2,829	15,963	5.64	2,554	4,274	26,200	6 13
Grey.....	53,970	347,618	6.44	55,619	6,919	43,728	6 32
Haldimand.....	8,320	61,187	7.35	9,790	6,218	34,137	5 49
Haliburton.....	5,492	33,296	6.06	5,327	657	3,285	5 00
Halton.....	7,442	56,221	7.55	8,995	983	6,557	6 67
Hastings.....	23,445	135,449	5.77	21,672	4,646	27,411	5 90
Huron.....	24,422	157,290	6.44	25,167	8,614	50,995	5 92
Kent.....	12,518	101,162	8.08	16,186	5,376	27,525	5 12
Lambton.....	19,289	133,577	6.93	21,372	7,239	38,729	5 35
Lanark.....	20,258	114,547	5.65	18,328	6,276	32,196	5 13
Leeds.....	7,133	42,125	5.91	6,740	6,638	33,190	5 00
Lennox and Addington..	9,858	64,800	6.57	10,368	5,139	26,414	5 14
Lincoln.....	6,845	43,299	6.33	6,928	2,014	12,527	6 22
Manitoulin.....	10,691	65,370	6.11	10,459	1,417	7,482	5 28
Middlesex.....	22,086	168,215	7.62	26,914	14,110	81,697	5 79
Muskoka.....	11,685	62,907	5.38	10,065	288	1,613	5 60
Nipissing.....	2,948	16,731	5.67	2,677	100	514	5 14
Norfolk.....	8,126	52,357	6.44	8,377	4,558	27,895	6 12
Northumberland.....	11,346	73,295	6.46	11,727	6,825	35,217	5 16
Ontario.....	23,036	184,596	8.01	29,535	3,154	19,555	6 20
Oxford.....	6,474	46,051	7.11	7,368	2,824	18,977	6 72
Parry Sound.....	11,699	73,382	6.27	11,741	152	836	5 50
Peel.....	6,906	53,322	7.72	8,532	2,183	13,382	6 13
Perth.....	8,802	56,109	6.37	8,977	3,837	26,360	6 87
Peterborough.....	12,847	77,096	6.00	12,335	870	5,229	6 01
Prescott.....	6,025	37,416	6.21	5,987	7,707	45,471	5 90
Prince Edward.....	3,595	22,176	6.16	3,548	1,864	9,059	4 86
Renfrew.....	32,416	164,728	5.08	26,356	5,090	27,486	5 40
Russell.....	4,397	26,975	6.11	4,316	732	3,697	5 05
Simcoe.....	49,472	361,172	7.30	57,788	4,146	22,181	5 35
Stormont.....	4,141	25,656	6.20	4,105	3,358	16,790	5 00
Victoria.....	22,948	139,682	6.09	22,349	4,275	27,916	6 53
Waterloo.....	6,385	45,004	7.05	7,201	1,350	8,640	6 40
Welland.....	5,791	34,512	5.96	5,522	4,388	21,940	5 00
Wellington.....	37,335	269,325	7.21	43,092	1,524	8,885	5 83
Wentworth.....	9,370	69,557	7.42	11,129	2,722	18,237	6 70
York.....	18,891	141,111	7.47	22,578	3,359	23,513	7 00
The Province:							
1906.....	684,808	4,543,981	6.64	727,037	196,387	1,112,236	5 66
1905.....	703,388	4,634,922	6.59	764,762	204,033	1,145,919	5 62
1904.....	778,837	4,972,042	6.38	581,729	201,064	1,146,592	5 70
1903.....	865,503	5,419,900	6.26	541,990	207,936	1,180,165	5 68
1902.....	916,092	5,690,673	6.21	728,406	202,529	1,150,523	5 68
1901.....	950,229	5,834,097	6.14	781,769	202,247	1,114,099	5 51
1900.....	957,307	5,805,921	6.06	894,112	216,734	1,139,559	5 26
1899.....	928,184	5,525,122	5.95	790,092	203,343	1,053,454	5 18
1898.....	865,179	5,104,686	5.90	847,378	190,080	998,049	5 25
1897.....	887,003	6,139,984	5.79	945,757	166,811	885,196	5 31

## FARM PROPERTY, IMPLEMENTS AND LIVE STOCK.

TABLE XXIV. Showing by County Municipalities of Ontario the value of farm lands, buildings, implements and live stock for the year 1906, together with the totals for the Province for the past ten years; also the aggregate value of live stock sold or slaughtered as determined from Tables xviii-xxii.

Counties and Districts.	Land.	Buildings.	Implements.	Live Stock.	Total.	Value of Live Stock sold or killed.
	\$	\$	\$	\$	\$	\$
Algoma .....	5,250,365	1,392,139	518,061	1,156,749	8,317,314	290,801
Brant .....	8,855,282	4,494,140	1,057,098	2,352,837	16,759,357	878,253
Bruce .....	24,910,286	9,591,732	2,309,990	7,202,212	44,014,220	2,748,347
Carleton .....	18,788,349	6,639,204	1,730,114	4,212,742	31,370,409	1,165,394
Dufferin .....	11,082,886	4,299,487	1,056,343	3,130,738	19,569,454	1,179,761
Dundas .....	8,472,132	3,755,930	1,103,175	2,352,862	15,684,099	563,287
Durham .....	12,917,477	5,419,330	1,345,057	3,718,548	23,400,412	1,265,868
Elgin .....	17,509,590	7,324,015	1,792,474	4,952,653	31,578,732	2,017,661
Essex .....	17,689,626	6,753,589	2,022,935	4,486,417	30,952,567	1,661,672
Frontenac .....	16,156,438	4,185,679	1,286,902	3,151,017	18,780,036	731,836
Glengarry .....	8,807,189	3,911,000	1,110,836	2,649,871	16,478,896	510,308
Grenville .....	6,926,083	3,534,220	870,801	1,803,854	13,134,958	448,416
Grey .....	25,482,379	12,007,427	3,221,137	8,960,214	49,671,157	3,274,612
Haldimand .....	8,243,385	4,388,335	1,179,784	2,556,643	16,368,147	852,235
Haliburton .....	1,219,072	488,533	179,780	461,442	2,348,827	117,427
Halton .....	9,309,240	4,307,267	928,492	2,392,213	16,937,212	910,730
Hastings .....	17,103,045	6,592,040	2,004,869	4,675,629	30,375,583	1,250,291
Huron .....	30,378,997	12,655,896	2,921,578	9,672,289	55,628,760	3,804,019
Kent .....	26,157,102	9,838,206	2,832,300	6,178,644	45,006,252	2,291,140
Lambton .....	22,050,541	7,974,350	2,168,826	6,097,500	38,291,217	2,225,371
Lanark .....	11,323,438	4,146,249	1,137,157	3,247,919	19,854,763	1,008,681
Leeds .....	11,913,820	4,804,800	1,227,285	3,051,118	20,997,023	735,991
Lennox and Add..	10,183,389	4,787,555	1,275,657	2,934,867	19,181,468	709,058
Lincoln .....	9,648,277	4,462,993	1,090,581	1,942,353	17,144,204	589,353
Manitoulin .....	1,457,018	562,641	225,030	722,671	2,967,360	217,754
Middlesex .....	33,804,990	13,311,008	3,096,978	9,836,742	60,049,718	3,546,887
Muskoka .....	2,552,290	1,108,783	380,613	887,165	4,928,851	225,701
Nipissing .....	2,625,828	692,400	317,685	593,326	4,229,239	131,881
Norfolk .....	12,021,547	5,449,717	1,530,646	2,969,625	21,971,535	989,453
Northumberland..	14,102,580	6,559,145	1,719,575	4,165,490	26,546,790	1,174,173
Ontario .....	18,143,041	7,707,319	1,854,647	5,421,817	33,126,824	1,811,690
Oxford .....	22,354,900	9,308,311	2,218,294	6,146,068	40,027,573	2,106,357
Parry Sound .....	2,229,849	974,243	387,508	971,380	4,562,980	228,357
Peel .....	12,444,303	5,889,833	1,364,240	3,518,872	23,217,248	1,429,561
Perth .....	23,438,266	9,982,063	2,423,913	6,919,212	42,763,454	2,556,616
Peterborough .....	11,447,449	3,709,699	1,068,069	2,805,547	19,030,764	820,277
Prescott .....	8,819,300	3,882,667	1,057,503	2,119,782	15,879,252	389,213
Prince Edward ...	7,700,080	3,690,861	983,232	2,028,768	14,402,941	468,055
Renfrew .....	12,717,597	4,903,333	1,589,570	3,830,575	23,041,075	866,015
Russell .....	6,320,350	2,445,007	735,130	1,555,215	11,055,702	301,747
Simcoe .....	29,290,777	11,740,298	3,279,830	8,166,209	52,477,114	2,780,400
Stormont .....	7,443,690	3,312,643	806,343	1,991,538	13,560,214	414,758
Victoria .....	13,042,012	4,357,725	1,301,234	3,840,189	22,541,160	1,184,748
Waterloo .....	12,956,029	6,222,818	1,449,129	3,349,554	23,977,530	1,665,540
Welland .....	9,176,877	4,086,662	1,009,034	2,107,519	16,380,092	623,986
Wellington .....	22,826,270	9,866,486	2,331,869	6,826,263	41,850,888	2,986,487
Wentworth .....	13,000,550	5,753,579	1,359,408	2,931,436	23,044,973	996,549
York .....	26,899,939	10,142,830	2,336,907	6,261,100	45,640,776	2,321,571
The Province:						
1906 .....	661,199,920	273,414,187	71,197,619	183,307,394	1,189,119,120	61,528,288
1905 .....	649,201,364	264,384,514	68,629,546	172,483,760	1,154,699,184	59,378,046
1904 .....	640,544,541	257,995,484	65,992,210	163,383,103	1,127,915,338	60,095,412
1903 .....	620,869,475	247,629,153	63,996,190	154,327,267	1,086,822,085	59,330,931
1902 .....	604,860,063	237,289,668	62,199,787	140,544,814	1,044,894,332	53,083,396
1901 .....	585,354,294	226,575,228	59,897,513	129,496,261	1,001,323,296	46,592,103
1900 .....	574,727,610	219,488,370	57,324,130	123,274,821	974,814,931	41,642,617
1899 .....	563,271,777	213,440,281	54,994,857	115,806,445	947,513,360	38,457,018
1898 .....	556,246,569	210,054,596	52,977,232	103,744,223	923,022,420	34,450,583
1897 .....	554,054,552	206,090,159	51,299,058	93,649,804	905,093,613	29,753,599



## FARM VALUES AND RENTALS.

TABLE XXV.—Showing by County Municipalities of Ontario, average values per acre of farm property in 1906 and rentals of leased farms based upon (1) the total acreage occupied, and (2) the area cleared, together with the average for the Province for the past ten years.

Counties and Districts.	Farm values, average per acre occupied.					Value build- ings, imple- ments and live stock per acre cleared.	Rent per acre on land.	
	Land.	Build- ings.	Imple- ments.	Live Stock.	Total.		Occu- pied.	Clear- ed.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Algoma .....	5 22	1 39	52	1 15	8 28	37 69	70	2 13
Brant .....	41 01	20 81	4 90	10 90	77 62	44 45	2 40	2 82
Bruce .....	27 00	10 40	2 50	7 81	47 71	34 84	1 77	2 26
Carleton .....	33 25	11 75	3 06	7 45	55 51	36 61	1 90	2 66
Dufferin .....	31 20	12 10	2 97	8 81	55 08	33 32	1 76	2 14
Dundas .....	35 79	15 87	4 66	9 94	66 26	43 45	1 89	2 54
Durham .....	34 89	14 64	3 63	10 04	63 20	35 15	2 27	2 57
Elgin .....	40 25	16 84	4 12	11 39	72 60	41 06	2 69	3 20
Essex .....	41 49	15 84	4 74	10 52	72 59	41 37	2 58	3 04
Frontenac .....	14 64	6 04	1 86	4 54	27 08	28 47	1 67	2 28
Glengarry .....	30 46	13 52	3 84	9 16	56 98	38 55	1 71	2 52
Grenville .....	25 39	12 95	3 19	6 61	48 14	34 59	1 32	1 78
Grey .....	23 76	11 20	3 00	8 35	46 31	35 20	1 53	2 00
Haldimand .....	29 31	15 61	4 20	9 09	58 21	34 40	1 69	2 05
Haliburton .....	2 11	84	31	80	4 06	27 98	61	1 19
Halton .....	41 41	19 16	4 13	10 64	75 34	44 20	2 10	2 96
Hastings .....	16 12	6 21	1 89	4 41	28 63	30 48	1 41	2 00
Huron .....	37 99	15 83	3 65	12 10	69 57	39 10	2 15	2 56
Kent .....	46 04	17 32	4 98	10 88	79 22	41 22	2 88	3 30
Lambton .....	33 42	12 08	3 29	9 24	58 03	34 47	1 85	2 40
Lanark .....	16 79	6 15	1 69	4 81	29 44	26 77	1 50	2 12
Leeds .....	25 44	10 26	2 62	6 52	44 84	34 21	1 60	2 32
Lennox & Addington .....	23 03	10 83	2 89	6 64	43 39	32 91	1 75	2 18
Lincoln .....	50 64	23 42	5 72	10 20	89 98	45 93	2 16	2 62
Manitoulin .....	5 65	2 18	87	2 81	11 51	35 46	68	1 64
Middlesex .....	44 61	17 56	4 09	12 98	79 24	40 15	2 27	2 89
Muskoka .....	4 60	2 00	68	1 60	8 88	37 14	65	2 30
Nipissing .....	4 98	1 31	60	1 13	8 02	35 54	65	2 00
Norfolk .....	30 13	13 66	3 84	7 44	55 07	36 90	2 08	2 62
Northumberland .....	32 19	14 97	3 92	9 51	60 59	36 43	2 00	2 47
Ontario .....	36 11	15 34	3 69	10 79	65 93	40 79	2 40	2 80
Oxford .....	47 45	19 76	4 71	13 04	84 96	45 03	2 71	3 30
Parry Sound .....	3 71	1 62	64	1 62	7 59	31 71	48	1 70
Peel .....	43 18	20 44	4 73	12 21	80 56	41 43	2 27	2 68
Perth .....	45 27	19 28	4 68	13 36	82 59	43 29	2 35	2 74
Peterborough .....	20 01	6 48	1 87	4 90	33 26	29 48	1 49	2 17
Prescott .....	30 30	13 34	3 63	7 28	54 55	35 86	1 65	2 85
Prince Edward .....	33 25	15 94	4 25	8 76	62 20	34 75	2 52	2 86
Renfrew .....	12 41	4 79	1 55	3 74	22 49	29 21	1 25	2 12
Russell .....	24 93	9 64	2 89	6 14	43 60	39 14	1 85	2 32
Simcoe .....	30 33	12 16	3 40	8 46	54 35	36 64	1 96	2 46
Stormont .....	29 96	13 33	3 24	8 01	54 54	40 20	1 57	2 26
Victoria .....	21 65	7 24	2 16	6 38	37 43	33 61	2 04	2 62
Waterloo .....	42 19	20 27	4 72	10 91	78 09	43 86	2 27	2 74
Welland .....	40 32	17 95	4 43	9 26	71 96	38 88	1 90	2 40
Wellington .....	36 31	15 70	3 71	10 86	66 58	38 46	1 98	2 48
Wentworth .....	47 96	21 23	5 02	10 81	85 02	47 76	2 75	3 20
York .....	50 09	18 88	4 35	11 66	84 98	42 67	3 00	3 40
The Province :								
1906 .....	27 23	11 26	2 93	7 55	48 97	37 42	2 00	2 65
1905 .....	26 84	10 92	2 84	7 14	47 74	36 28	1 96	2 55
1904 .....	26 53	10 69	2 73	6 77	46 72	35 29	1 91	2 49
1903 .....	25 95	10 35	2 67	6 45	45 42	34 15	1 89	2 47
1902 .....	25 49	10 00	2 62	5 93	44 04	32 43	1 85	2 47
1901 .....	24 76	9 59	2 53	5 48	42 36	30 96	1 82	2 46
1900 .....	24 37	9 31	2 43	5 23	41 34	30 09	1 80	2 48
1899 .....	24 02	9 10	2 34	4 94	40 40	29 31	1 77	2 51
1898 .....	23 78	8 98	2 26	4 44	39 46	28 33	1 76	2 50
1897 .....	23 72	8 82	2 20	4 01	38 75	27 31	1 73	2 44

## MARKET PRICES.

TABLE XXVI. The following table is compiled from thirty-four well distributed market points from quotations in the local press. The figures for the four months September-December, 1906, are also given, together with the average price for the past ten years, and the average for twenty-five years, 1882-1906.

Counties and Districts.	Fall Wheat, per bush.	Spring Wheat, per bush.	Barley, per bush.	Oats, per bush.	Peas, per bush.	Beans, per bush.	Rye, per bush.	Buckwheat, per bush.	Corn (in ear), per bush.	Hay, per ton.	Potatoes, per bush.	Wool, per lb.
	cts.	cts.	cts.	cts.	cts.	\$ c.	cts.	cts.	cts.	\$ c.	cts.	cts.
Amherstburg .....	65.8	68.0	40.7	31.2					36.5	7 13	47.6	
Barrie .....	68.8	65.6	45.0	33.3	72.2		59.6	46.4	38.0	9 27	52.3	15.1
Belleville .....	69.6	75.0	47.4	35.8	75.0		62.0	55.0		8 92	62.8	16.0
Bowmanville .....	73.6	69.8	47.3	33.1	68.9		63.2	49.6		5 50	46.0	14.5
Bracebridge .....				40.9	78.7					10 00	57.7	16.3
Brampton .....	71.0	68.6	49.3	33.6	73.2		67.3				53.1	
Brantford .....	68.3	67.5	45.5	33.0	69.3		63.3	51.8	38.0	7 54	61.3	
Chatham .....	70.0		45.7	31.9		1 08			38.1	9 17	61.5	
Cornwall .....			50.0	37.7				50.0		8 90	51.8	
Dunnville .....	67.4	67.4	41.9	31.5	65.5		55.0	52.6	34.1	7 09	60.4	
Forest .....	68.2		40.0	32.5	63.3	1 08			45.0	6 85	52.6	16.4
Goderich .....	70.1	68.5	42.2	32.3	70.0		45.0	50.4		7 78	46.9	16.0
Guelph .....	68.6		44.2	32.9	71.7		69.3	48.0	41.7	9 99	54.6	15.3
Hamilton .....	73.4		48.0	36.8	69.7		67.0	50.0	40.0	9 65	63.1	16.0
Lindsay .....	67.5	63.7	42.5	31.7	69.6		59.3	48.3		9 35	49.0	15.5
London .....	70.3		46.4	35.9	68.8		54.5	55.0	40.0	11 95	52.7	
Oakville .....	70.6	68.7	46.5	33.2	66.1		57.9			8 00	48.6	
Orangeville .....	71.6	70.2	44.6	32.2	72.4		67.5	47.9		8 03	50.4	15.9
Ottawa .....				38.0						17 89	58.7	
Owen Sound .....	70.6	70.0	46.0	35.2	75.5			49.7		11 30	45.5	
Pembroke .....	74.6	73.7	42.1	33.6	72.8	1 70	51.4	42.1	36.7	11 27	50.3	17.3
Peterborough .....	69.7	65.3	43.3	33.5	73.1		60.9	46.8		12 80	49.6	
Pictou .....	70.3	70.8	46.2	34.1	75.3	1 27	57.2	50.6		7 43	62.7	15.0
St. Catharines .....	70.9			39.6		1 33			40.5	10 74	58.6	15.5
St. Thomas .....	69.5		42.0	30.2	65.7				34.1	10 21	51.9	
Sault Ste. Marie .....	95.0		52.5	42.5	72.5					9 50	63.3	
Simcoe .....	69.0	70.5	44.5	32.7	71.3		64.3	49.0	33.9	8 47	53.9	
Stratford .....	68.3	67.9	40.7	31.8	70.9					7 32	50.2	
Toronto .....	73.7	70.7	52.1	38.2	77.1	1 63	71.2	54.3	46.7	13 12	59.5	16.0
Uxbridge .....	70.9	67.3	43.3	33.1	72.1		62.9	46.9		7 50	41.1	17.5
Walkerton .....	69.7		46.0	34.1	71.7					8 89	48.2	18.3
Waterloo .....	74.6		44.5	35.2	65.2				39.3	7 49	56.5	16.0
Welland .....	69.6	69.6	46.2	33.1	64.7	1 65	50.0	50.0	32.5	8 94	58.1	
Woodstock .....	69.1	69.5	44.4	32.7	68.2	1 34	58.6	50.0		9 37	53.9	14.3
The Province:												
September .....	71.3	69.3	44.0	32.6	68.3	1 37	57.8	48.7	38.9	8 53	53.6	16.2
October .....	70.9	68.8	44.5	33.7	69.7	1 38	60.3	48.6	37.7	8 60	53.2	16.1
November .....	70.5	69.0	45.4	34.7	71.7	1 36	62.2	50.3	37.0	9 30	53.6	15.9
December .....	67.0	68.6	46.3	35.2	72.6	1 44	63.6	50.3	36.8	10 11	54.9	15.7
1906 .....	70.7	68.9	45.0	34.0	70.6	1 39	60.9	49.5	37.6	9 10	53.8	16.0
1905 .....	76.5	74.9	42.9	33.6	65.3	1 32	56.8	50.0	36.9	7 72	46.0	16.5
1904 .....	98.7	94.2	43.7	32.3	63.0	1 22	57.6	48.6	37.4	7 97	50.7	11.7
1903 .....	75.1	74.4	42.1	29.3	64.3	1 41	48.6	44.3	36.9	7 94	44.1	10.0
1902 .....	70.7	69.6	45.1	34.8	71.0	1 35	50.5	48.0	40.6	8 15	56.5	12.8
1901 .....	66.1	66.8	45.0	36.2	65.3	1 25	49.3	48.4	38.0	7 99	42.6	13.4
1900 .....	66.4	67.5	38.9	26.5	57.1	1 00	48.5	43.7	31.7	8 48	26.1	15.4
1899 .....	66.7	66.5	39.5	27.7	57.3	1 08	50.0	45.5	19.8	7 72	32.8	14.3
1898 .....	69.4	69.2	38.0	25.8	52.2	70	43.5	38.2	20.1	6 22	44.1	16.6
1897 .....	78.2	78.6	27.0	22.6	42.1	65	37.7	30.0	19.7	7 18	39.9	18.4
1882-1906 .....	78.2	80.5	46.9	31.7	58.6	1 09	52.0	41.5	*28.7	8 81	41.1	16.9

\* Average fifteen years 1892-1906.



## AGRICULTURAL STATISTICS OF THE UNITED STATES.

## WHEAT.

Year.	Acres.	Bushels.	Average yield per acre.	Total value.
1906.....	47,305,829	735,260,970	15.5	\$490,332,760
1905.....	47,554,079	692,979,489	14.5	518,372,727
1904.....	44,074,875	552,399,517	12.5	510,489,874
1903.....	49,464,967	637,821,835	12.9	443,024,326
1902.....	46,202,424	670,063,008	14.5	422,224,117
1901.....	49,895,514	748,460,218	15.0	467,350,156
1900.....	42,495,385	522,229,505	12.3	323,525,177
1899.....	44,592,516	547,303,846	12.3	319,545,259
1898.....	44,055,278	675,148,705	15.3	392,770,320
1897.....	39,465,066	530,149,168	13.4	428,547,121
1896.....	34,618,646	427,684,346	12.4	310,602,539
1895.....	34,047,332	467,102,947	13.7	237,938,998
1894.....	34,884,436	460,267,416	13.2	225,902,025
1893.....	34,629,418	396,131,725	11.4	213,171,881
1892.....	38,554,430	515,949,000	13.4	322,111,881
1891.....	39,916,897	611,780,000	15.3	513,472,711

## CORN.

Year.	Acres.	Bushels.	Average yield per acre.	Total value.
1906.....	96,737,581	2,927,416,091	30.3	\$1,166,626,479
1905.....	94,011,369	2,707,993,540	28.8	1,116,696,738
1904.....	92,231,581	2,467,480,934	26.8	1,087,461,440
1903.....	88,091,993	2,244,176,925	25.5	952,868,801
1902.....	94,043,613	2,523,648,312	26.8	1,017,017,349
1901.....	91,349,928	1,522,519,891	16.7	921,555,763
1900.....	83,320,872	2,105,102,526	25.3	751,220,034
1899.....	82,108,587	2,078,143,933	25.3	629,210,110
1898.....	77,721,781	1,924,184,660	24.8	552,023,428
1897.....	80,095,051	1,902,967,933	23.8	501,072,952
1896.....	81,027,156	2,283,875,165	28.2	491,006,967
1895.....	82,075,830	2,151,138,580	26.2	544,985,534
1894.....	62,582,269	1,212,770,052	19.4	554,719,162
1893.....	72,036,465	1,619,496,131	22.5	591,625,627
1892.....	70,626,658	1,628,464,000	23.1	642,146,630
1891.....	76,204,515	2,060,154,000	27.0	836,439,228
1881.....	64,262,025	1,194,916,000	18.6	759,482,170

## OTHER CROPS.

	1906.		1905.		1904.	
	Acres.	Bushels.	Acres.	Bushel.	Acres.	Bushels.
Oats.....	30,958,768	964,904,522	28,046,746	953,216,197	27,842,669	894,595,552
Barley.....	6,323,757	178,916,484	5,095,528	136,651,020	5,145,878	139,748,958
Rye.....	2,001,904	33,374,833	1,730,159	28,485,952	1,792,673	27,241,515
Buckwheat....	789,208	14,641,937	760,118	14,585,082	793,625	15,008,336

Figures for United States are in Winchester bushels.

## CROPS IN THE NORTHWEST PROVINCES OF CANADA.

Year.	Wheat.		Oats.		Barley.		Flax.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
<i>Alberta.</i>								
1902.....	45,064	850,122	118,997	3,776,976	22,201	473,108	373	4,476
1903.....	63,391	1,200,598	162,314	5,187,511	42,219	1,077,274	830	7,753
1904.....	55,707	938,200	180,698	5,609,496	61,549	1,608,241	367	5,003
1905.....	107,527	2,306,524	242,801	9,514,180	64,830	1,773,914	581	8,337
1906.....	177,127	3,966,020	335,728	13,136,913	73,588	2,157,957	3,647	38,491
<i>Saskatchewan</i>								
1902.....	580,860	13,110,330	193,200	6,975,796	14,275	298,632	16,694	153,709
1903.....	777,822	15,121,015	280,096	9,164,007	27,679	665,593	31,644	285,697
1904.....	910,359	15,944,730	346,530	10,756,350	24,650	598,336	15,917	166,434
1905.....	1,130,084	26,107,286	449,936	19,213,055	32,946	893,396	25,315	398,399
1906.....	1,730,586	37,040,098	639,893	23,965,528	53,565	1,316,415	76,005	710,689
<i>Manitoba.</i>								
1889.....	623,245	7,201,519	218,744	3,415,104	80,238	1,051,551	.....	.....
1890.....	746,058	14,655,769	235,534	9,513,443	60,035	2,069,415	.....	.....
1891.....	916,614	23,191,599	305,644	14,752,605	89,828	3,197,876	.....	.....
1892.....	875,990	14,453,835	332,974	11,654,090	97,644	2,831,676	.....	.....
1893.....	1,003,640	15,615,923	388,529	9,823,935	114,762	2,547,653	9,737	116,454
1894.....	1,010,186	17,172,883	413,686	11,907,854	119,528	2,981,716	30,500	336,000
1895.....	1,140,276	32,775,038	482,653	22,555,733	153,839	5,645,036	.....	1,281,354
1896.....	999,598	14,371,806	442,445	12,502,318	127,885	3,171,747	.....	259,143
1897.....	1,290,882	18,261,950	468,141	10,629,513	153,266	3,183,602	.....	247,836
1898.....	1,488,232	25,313,745	514,824	17,308,252	158,058	4,277,927	.....	350,000
1899.....	1,629,995	27,922,230	575,136	22,318,378	182,912	5,379,156	21,780	304,420
1900.....	1,457,396	13,025,252	429,108	8,814,312	155,111	2,939,477	20,437	164,313
1901.....	2,011,835	50,502,085	689,951	27,796,588	191,009	6,536,155	20,978	266,420
1902.....	2,039,940	53,077,267	725,060	34,478,160	329,790	11,848,422	41,200	564,440
1903.....	2,442,873	40,116,878	855,431	33,035,774	326,537	8,707,252	55,900	586,950
1904.....	2,412,235	39,162,458	943,574	36,289,979	361,004	11,177,970	35,428	464,106
1905.....	2,643,588	55,761,417	1,031,239	45,484,025	432,298	14,064,176	24,770	326,964
1906.....	3,141,537	61,250,413	1,155,961	50,692,978	474,242	17,532,554	18,790	274,330

## OTHER CROPS IN MANITOBA.

Year.	Rye.		Peas.		Potatoes.		Roots.	
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
1893.....	2,229	29,422	.....	.....	.....	1,649,385	20,919	3,896,798
1894.....	.....	59,924	.....	18,434	.....	2,035,336	7,880	1,841,942
1895.....	.....	81,082	.....	28,229	16,716	4,042,562	6,785	2,285,283
1896.....	.....	52,255	.....	23,383	12,260	1,962,490	6,715	1,898,805
1897.....	.....	48,344	.....	33,380	13,576	2,033,298	6,130	1,220,070
1898.....	.....	63,860	.....	31,880	19,781	3,253,038	8,448	2,471,715
1899.....	3,217	64,340	1,366	20,490	19,151	3,226,395	10,079	2,670,108
1900.....	2,480	25,792	780	9,048	16,880	2,226,880	7,482	1,452,780
1901.....	2,707	62,261	879	16,349	24,429	4,797,433	10,214	2,925,362
1902.....	2,559	49,900	1,596	34,154	22,005	3,459,325	12,175	3,230,995
1903.....	4,899	88,182	2,357	41,483	27,198	4,757,000	12,251	3,452,340
1904.....	6,293	125,860	2,562	51,240	24,471	3,799,569	14,870	3,741,580
1905.....	6,923	173,075	2,081	53,706	25,835	4,759,646	13,411	3,481,653
1906.....	4,195	100,680	2,559	67,302	25,043	4,702,595	13,001	3,446,432

Canadian figures are given in Imperial bushels.



# PART II.—CHATTEL MORTGAGES.

Table showing by County Municipalities of Ontario the total number and amount of Chattel Mortgages on record and undischarged on December 31st, 1906, against (1) all occupations, (2) farmers; together with totals for the Province for the past ten years.

Counties and Districts.	Chattel Mortgages against all occupations.				Chattel Mortgages against farmers.			
	To secure existing debt.		For future indorsation.		To secure existing debt.		For future indorsation.	
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amt.
		\$		\$		\$		\$
Algoma	*225	806,862	3	30,289	126	29,005		
Brant	257	157,556			93	57,291		
Bruce	437	224,497			277	76,489		
Carleton	563	662,808	5	3,391	67	29,504	1	141
Dufferin	113	44,707	1	1,200	73	30,881		
Elgin	482	206,320			215	70,149		
Essex	754	828,718	1	3,000	302	90,618		
Frontenac	360	236,525			254	72,963		
Grey	617	226,917			433	140,342		
Haldimand	133	53,604			90	30,713		
Haliburton	60	14,328			55	8,393		
Halton	63	70,085			22	41,482		
Hastings	509	282,917	10	90,220	376	99,304	3	748
Huron	241	197,801	1	125	135	68,361		
Kent	965	301,317			775	218,199		
Lambton	434	408,900			332	109,981		
Lanark	144	67,293			70	23,345		
Leeds	273	116,128			176	60,875		
Lennox and Addington	195	92,675	2	625	117	51,260	1	125
Lincoln	152	126,420	1	205	65	29,626	1	205
Manitoulin	97	46,785	3	5,945	73	25,189		
Middlesex	383	208,520			97	45,093		
Muskoka	206	199,487	2	20,000	122	22,061		
Nipissing	†421	1,052,065			168	50,354		
Norfolk	237	73,951			174	36,874		
Northumberland	426	279,621			234	122,481		
Ontario	219	146,917	9	1,888	136	88,565	9	1,888
Oxford	228	206,415	1	600	74	36,124	1	600
Parry Sound	194	††879,194	9	36,697	76	93,412		
Peel	82	54,545			48	30,136		
Perth	162	106,420			83	57,261		
Peterborough	140	93,277			122	65,024		
Prescott	150	146,602			80	25,935		
Prince Edward	113	119,222	1	60	80	25,959	1	60
Rainy River	73	142,468			25	12,880		
Renfrew	214	115,179	2	3,000	154	66,810		
Simcoe	564	740,046			340	276,635		
Stormont	272	135,351	17	13,599	175	78,922	8	3,847
Thunder Bay	60	135,419	2	2,700	12	3,354		
Victoria	180	82,276			119	41,721		
Waterloo	156	160,046			51	47,018		
Welland	\$248	1,976,735	9	155,785	77	17,046		
Wellington	223	140,678			88	47,699		
Wentworth	963	368,733	8	21,376	133	65,587		
York	1,620	2,514,361	8	25,815	148	60,505		
The Province:								
1906	14,608	15,250,691	97	416,520	6,943	2,781,426	25	7,614
1905	16,355	17,218,030	96	1,154,328	7,403	2,758,046	29	10,344
1904	15,568	13,656,740	94	472,761	7,100	2,559,195	42	25,034
1903	14,885	14,354,605	187	491,978	7,085	2,548,758	88	19,446
1902	15,684	10,890,615	142	1,099,188	7,193	2,616,538	42	21,387
1901	16,299	10,613,564	247	237,445	7,757	2,854,759	134	30,207
1900	17,321	11,669,806	307	499,184	8,440	3,110,543	121	30,840
1899	18,216	11,067,664	291	324,628	9,392	2,988,853	124	34,798
1898	19,526	12,001,075	283	281,142	10,514	3,547,554	117	32,943

\* Including 10 lumbermen for \$664,067

† Including 22 lumbermen for \$888,269.

†† Including 15 lumbermen for \$726,600. The return is for 1905, the return for 1906 not yet received.

‡ Including 8 construction companies for \$1,810,473.

Thirty-Eighth Annual Report

OF THE

Fruit Growers' Association

OF

Ontario,

1906

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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1907



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TORONTO

*To the Honourable WILLIAM MORTIMER CLARK, K.C.,  
Lieutenant-Governor of the Province of Ontario.*

**MAY IT PLEASE YOUR HONOUR:**

I have the pleasure to present herewith for the consideration of your Honour the Report of the Ontario Fruit Growers' Association, for 1906.

Respectfully submitted,

**NELSON MONTEITH,**  
*Minister of Agriculture.*

**TORONTO, 1907.**



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# Fruit Growers' Association of Ontario.

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## OFFICERS FOR 1907.

*President*.....HAROLD JONES, Maitland.  
*Vice-President*.....ELMER LICK, Oshawa.  
*Secretary-Treasurer*.....P. W. HODGETTS, Parliament Buildings,  
Toronto.

### *Directors:*

Agricultural Division No.		
1.....	A. D. HARKNESS, Irena.	
" " "	2.....	A. A. WRIGHT, Renfrew.
" " "	3.....	HAROLD JONES, Maitland.
" " "	4.....	W. H. DEMPSEY, Trenton.
" " "	5.....	WM. RICKARD, Newcastle.
" " "	6.....	ELMER LICK, Oshawa.
" " "	7.....	A. W. PEART, Burlington.
" " "	8.....	G. A. ROBERTSON, St. Catharines.
" " "	9.....	H. H. GROFF, Simcoe.
" " "	10.....	A. E. SHERRINGTON, Walkerton.
" " "	11.....	A. O. TELFER, Ilderton.
" " "	12.....	D. JOHNSON, Forest.
" " "	13.....	C. L. STEPHENS, Orillia.

*Ontario Agricultural College:* Prof. H. L. HUTT, Guelph.

*Honorary Directors:* THOS. BEALL, Lindsay; A. M. SMITH, St. Catharines; W. T. MACOUN, Ottawa.

*Auditor:* J. M. DUFF, Guelph.

## REPRESENTATIVES TO FAIR BOARDS AND CONVENTIONS.

*London:* JAS. S. SCARFF, Woodstock; A. O. TELFER, Ilderton.

*Ottawa:* R. B. WHYTE, Ottawa; A. A. WRIGHT, M.P., Renfrew.

*Toronto:* W. H. BUNTING, St. Catharines; P. W. HODGETTS, Toronto.

## COMMITTEES.

*Executive:* President, Vice-President, and Secretary, with W. H. BUNTING and A. E. SHERRINGTON.

*Board of Control, Fruit Experiment Stations:* G. C. CREELMAN, Chairman; Prof. H. L. HUTT; P. W. HODGETTS.

Elected by the Association: A. M. SMITH, W. T. MACOUN, G. A. ROBERTSON.

*Transportation:* W. H. BUNTING, R. J. GRAHAM, D. JOHNSON, W. L. SMITH, ROBT. THOMPSON, H. DAWSON.

*Co-operation:* A. E. SHERRINGTON; D. JOHNSON, Forest; J. E. JOHNSON, Simcoe; ROBT. THOMPSON, W. H. DEMPSEY.

*New Fruits:* Prof. H. L. HUTT; W. T. MACOUN; E. MORRIS.

*Historical:* ALEX. MCNEILL; T. H. RACE; L. WOOLVERTON; H. H. GROFF; W. H. DEMPSEY.

*Fruit Show:* W. H. BUNTING; A. W. PEART; ELMER LICK; P. W. HODGETTS.





# Fruit Growers' Association of Ontario.

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## ANNUAL MEETING.

The forty-seventh annual meeting of the Fruit Growers' Association of Ontario was held in the City Hall, Toronto, on the 6th, 7th, and 8th of November, 1906.

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## REPORT OF THE EXECUTIVE FOR 1906.

Your Executive have met formally during the past 12 months on four occasions. Early in the new year, it was seen that the clauses relating to affiliated associations, as adopted at the last annual meeting, would not be workable under the conditions existing at the latter time. In November, when the changes were made, the numerous horticultural societies in the Province were nominally eligible for affiliation, and as these societies were receiving government assistance, it was thought that the affiliation fee should be fixed as high as 75c. per member. The day following the close of the fruit convention, representatives of the horticultural societies met and formally organized the Association of Horticultural Societies of Ontario. This action relieved the Fruit Growers' Association of any further necessity of looking after the interests of these societies, and at the same time changed entirely the outlook for membership during the coming year. None of the local Fruit Growers' Associations were receiving Government assistance and were unable to pay the high fee of 75 cents per member.

A meeting of the Executive was at once called for Jan. 2nd, at St. Catharines, and after a thorough discussion, the following resolution was drawn up:

Moved by W. H. BUNTING, St. Catharines, seconded by HAROLD JONES, Maitland, that "After consideration by the Executive Board, of the best means of encouraging the formation of local Fruit Growers' Associations upon a satisfactory basis, and the consolidation of said local Associations with the Provincial Association, it is hereby resolved that we deem it in the interests of the Ontario Fruit Growers' Association to modify sections 25 and 27 of the present Constitution to meet the exigencies of the situation, by making the following changes in the aforesaid sections; that is to say, in Section 25, the words 'seventy-five' be changed to 'fifty,' and Section 27 to read as follows: 'Each affiliated Association may send one duly accredited delegate to the Annual Meeting, one-half of whose actual expenses shall be defrayed by the Provincial Association.' It is hereby understood that the above changes are subject to the approval of the Minister of Agriculture for the Province."

In accordance with the last clause, the report was submitted to the Hon. Mr. Monteith, and after a thorough explanation, was formally ratified by him. Notices of these changes were at once sent to all interested parties, including the officers of all fruit growers' associations throughout the Province, and the result this year has been very encouraging.



At the same meeting, a committee consisting of the President, Mr. Bunting, and the Secretary were appointed to wait on the Deputy Minister of Agriculture with a view to making all proposed changes in the Agriculture and Arts Act harmonize with the revised constitution of the Association. In accordance with the request of the Executive, a meeting was held in Toronto with Mr. James. The points likely to conflict, such as the number of directors, the membership fee, etc., were talked over, and an agreement reached that was satisfactory to both parties. The new Act which comes into force in the spring of 1907 allows of greater diversity among the Associations in respect to the method of election of directors and other vital points, but makes all revision of constitutions subject to the approval of the Minister of Agriculture.

A third meeting was held during the Toronto Exhibition to consider matters relating to the Annual Convention and the Fruit Show. A draft programme was submitted and various topics suggested. The Secretary was authorized to write to J. H. Hale, the noted peach grower of Georgia and Connecticut; Roland Morrill, of Benton Harbor, Michigan, and Prof. H. A. Surface, of Harrisburg, Pennsylvania, in reference to attending the convention, but was unable for various reasons to secure their services. Prof. Surface wrote that he would accept the invitation, but wired on Nov. 30th that he could not come. Mr. E. D. Smith, owing to illness, was also compelled to refuse our invitation at the last moment. Prof. P. J. Parrott, of Geneva, N. Y., took Prof. Surface's place.

Judges were appointed for the various classes of fruit at the Show, and an allowance of five dollars was voted to each to help pay their travelling expenses. An allowance of \$20 and expenses was voted for the work of a Superintendent to assist the Secretary for the week of the Show. Mr. Kydd, of Simcoe, who had been appointed by your Board, was unable to undertake this work, and Mr. Reid, of St. Catharines, was asked to take his place. Mr. Reid has had considerable experience in such work, and was Secretary of the Niagara District Horticultural Exhibition, held in St. Catharines this summer.

The resignation of Mr. T. H. Race, of Mitchell, your Director for Division 11, was received and accepted, and as the end of the Association year was so close it was decided not to appoint a successor. Mr. Race has been connected with the Association for many years, has occupied the position of Director since 1890, with the exception of the years 1892-93-94, when he held the office of Vice-President and President. He felt that his absence from the country in his position as Commissioner to the New Zealand Exposition would take so much of next year that in fairness to the Division he represented, he should leave the office open to some one more likely to be of use to the Province and the Association.

On Sept. 14th, a meeting was held at St. Catharines to consider the question of a further revision of the Constitution rendered necessary by the new Act respecting Agricultural Associations which comes into force in 1907, and also by the changed conditions in regard to general representation, as expressed by many of the best fruit growers of the Province. Much adverse criticism of the present mode of election of Directors has been given during recent years, and it has been thought wise to allow the members of the Association an opportunity this year of expressing their opinion on the wisdom of the new method as adopted by the Vegetable Growers' Association and proposed for the two Dairymen's Associations. In addition to the Executive, there were present at St. Catharines, Mr. Murray Pettit, of Winona;

Mr. Ruddick, of Ottawa, and Mr. H. B. Cowan, of Toronto. After talking the matter over thoroughly, a sub-committee consisting of Messrs. Scarff, Pettit and the Secretary were appointed to draft out the proposed amendments in consultation with Mr. Cowan.

This Committee met on Oct. 17th, and drew up the report, which has since been submitted to each of the members by circular letter. The matter will come up on Wednesday afternoon, and it is to be hoped that something definite and feasible will then be decided upon.

#### MEMBERSHIP.

The total number of members up to the close of the year is 434. Of this number 300 have been sent in by 13 associations, thus constituting 69 per cent. The associations represented are as follows:—Niagara District Association, Arkona, Forest, Ilderton, Meaford, Orillia, Southern Ontario, Burlington, Jordan Harbor, Clarkson, Newcastle, and Oakville. The individual members have been received from various sources, chiefly by letter from the members direct. About 50 names were secured at the time of the last convention. All of those who joined the past year are men connected largely with fruit growing, the men whom we are most anxious to reach and who should take a vital interest in our association.

It will be seen that these affiliated associations are widely scattered and represent the Province fairly well except in the eastern part. Associations are, however, now started at Belleville, Trenton and Oshawa, and should these affiliate, the fruit sections of this portion of the Province will be better looked after. Your director for Division 3, Mr. Harold Jones, has expressed the hope that he will be able to get together an association of ten or more members and keep alive interest in fruit growing at the extreme eastern part of the Province where, in the St. Lawrence Valley, the Fameuse apple and kindred types succeed to perfection.

In connection with the question of membership Mr. Race's work in organizing and securing the affiliation of several associations during the year is worthy of special mention. His long acquaintance with the fruit interests of the Province and the enthusiasm that he arouses by his addresses have strengthened all of the associations that he visited.

#### CO-OPERATIVE WORK.

The formation of co-operative fruit shipping associations has proceeded steadily under the influence of the co-operative committee and with the help of the Department of Agriculture through Mr. Putnam. A number of joint meetings were arranged for during March and April and were addressed by Messrs. Sherrington, Johnson, Carey and Gifford. In addition, Mr. Sherrington visited several points by special request and succeeded in putting several associations in good shape for work this fall. About 18 associations are now in running condition and the outlook for the fruit-growers in these sections is brighter than for many years.

Two meetings of the co-operative committee have been held during the year. A full report of their proceedings will be given on Thursday afternoon. Owing to the efforts of Mr. Sherrington, the Chairman, a union of most of the associations now in existence was effected at the second meeting on August 14th, and a new association, purely commercial in its aims, was organized, to be known as the Ontario Co-operative Fruit Growers' Association. This new association will relieve your association of the burden of undertaking work outside of its regular aims, and at the same time will per-



mit of further expansion of the co-operative idea, such as placing representatives in the markets, opening up new markets, etc. We hope to receive an extended report on the work of this association on Thursday.

The Transportation Committee met in Toronto on January 16th and discussed matters that were likely to come before the Dominion Conference. A recommendation was made that the expenses of three of the delegates to the west in 1905 be paid by the association. These men were sent out to watch the treatment received by the fruit cars en route to Winnipeg, the condition of the fruit on arrival and other points of interest to the growers. The railways provided the transportation both ways. In accordance with this recommendation the sum of \$36.75 has been paid to two of the men to cover their actual expenses.

The committee were very strong in their demand that the express companies be placed under the control of the Railway Commission. This matter was brought to the attention of the Cabinet at the time of the Conference, and as a result the rates of these companies were by law made subject to the Railway Board. Two of the objects for which this committee have persistently fought, the placing of both express and freight carrying corporations under control of some board to which appeal could readily be made, have thus been accomplished. It now remains to prepare as much information as possible of all grievances against the companies, so that in case of appeal to the commission, your committee may be in possession of as much evidence as possible in support of their claims.

The county prize scheme, originated by Mr. McNeill a year ago, and adopted by fifteen counties for our previous show, was carried on again with slightly better success this year. The correspondence in connection therewith is enormous, as over 500 councillors alone had to be written to this year, together with local committees, clerks and other parties interested. Twenty-five counties were asked for the grant of \$25 and only five of these refused, namely, Elgin, Middlesex, Wentworth, Carlton and Huron. The twenty counties offering the prize are as follows:—

Brant	Lambton	Perth
Bruce	Leeds and Grenville	Prince Edward
Essex	Lincoln	East Simcoe
Grey	Norfolk	Stormont, Dundas and Glengarry
Halton	Northumberland and Durham	Victoria
Hastings	Ontario	York
Kent	Oxford	

Local parties in every instance were asked to choose the ten varieties best suited to their conditions and the whole list was then printed in the special prize list which was distributed, together with entry cards, as widely as possible. While every county is not yet as well represented by entries as we would like, the result is still very gratifying, as over 500 entries have been received.

Your secretary has to specially thank in this connection, those gentlemen who were so active in waiting on the county councils at the June meetings in support of our application for these grants. All of the directors have rendered good service, and in addition I desire to mention Mr. Robt. Thompson, of St. Catharines; Mr. C. L. Stephens, of Orillia; Mr. A. Gifford, of Meaford; Mr. Harry Dempsey, of Rednersville; Messrs. Fraser and Johnson, of Leamington; Mr. D. Johnson, of Forest; and Mr. W. D. A. Ross, of Chatham; Mr. J. C. Harris, of Ingersoll, and several others. These voluntarily took the time to attend the council meetings and were afterward enthusiastic enough to help advertise the scheme as thoroughly as possible. That they have been successful is shown by the number of entries.

## HORTICULTURAL EXHIBITION.

The exhibition of last year was generally admitted to be the finest of its kind ever held in Canada. The attendance, however, was still below the mark, and as a result there was a deficit of between \$400 and \$500. The city council gave an additional sum of \$250 on condition that the remaining sum be collected. This was undertaken by the general committee and successfully accomplished. It was felt that if the people of Toronto and the Province generally could be brought to realize the value of the show that its financial success would be assured. It was, therefore, determined to continue the show for another year and to make a still greater effort to get the attendance of the people.

The general committee have met during the year at frequent intervals; in fact during the last two months every Monday night. The special committees have also spared no effort this year to complete their work in every detail. After much thought and very careful consideration, it was decided to procure a first-class musical attraction for the week of the show, and after some correspondence the Black Dike Band, of England, which was on a tour of the world, was engaged for nine performances at a cost of \$2,000. The additional expense seemed enormous, but it was felt that it would be necessary to procure the best talent obtainable, and if the citizens of Toronto will patronize these concerts as they are in the habit of doing, there should be a much better financial statement to present this year than last.

The general prize list was ready for distribution much earlier this year, coming out about a week later than the date set by the directors. The fruit sections were printed in the July issue of the Canadian Horticulturist in accordance with directions from the board. All of the directors and as many other interested parties as possible were asked for criticisms and suggestions on last year's lists, and after much labor by the Show Committee the present list was adopted. Changes have been made in Classes 3 and 4 where the varieties called for have been specified. Owing to lack of competition, the section for hot-house grapes have been struck out. Several changes in varieties in the other classes were made to encourage greater competition. In the package sections increases were made in the prizes to bring them up to a better equivalent of the value of the fruit which has, in the case of prize lots, become the property of the association. In all about \$130 was added, making a total of \$907, or with the county prizes added, \$1,407.

The entries are well scattered over the Province, and exclusive of the county specials are about 300 in excess of last year, numbering as follows: Barrels, 63; boxes, 193; baskets, 13; plates, 442; pyramids, 43; collections, 5; jams, preserved fruits and jellies, 192.

The office labor alone in connection with these 1,392 entries has become so great that two extra clerks have been working on them since last Monday. The expenses of the show of 1906 will be considerably greater than that of 1905, the county specials having added much to both labor and expense.

## DOMINION CONFERENCE.

A full report of the proceedings of the conference has been published and generally distributed. The nine delegates appointed by the board at their last meeting were all in attendance, with the exception of Mr. Hilborn, owing to ill health, and Mr. Thompson, who was in British Columbia. Their places were taken by Mr. Ross, of Chatham, and Mr. Stewart, of Homer. Mr. Scarff and your secretary were also in attendance, as well as a number of other members, including Prof. Hutt and Mr. Woolverton.



The results of this conference will be discussed by Mr. Bunting and Mr. Peart before the association on Wednesday. It is to be hoped that the fruit growers of the Dominion will hold the Minister of Agriculture to his word to call such a conference at regular intervals. The work accomplished this year was invaluable, but there remains a very great deal yet to be done.

The Ontario delegates met at the Walker House on the day previous to the opening of the conference and thoroughly discussed the questions that had been proposed by the chief of the fruit division as worthy of attention. The instructions of the last annual meeting were also considered, and by the joint expression of opinion the delegates were much better prepared for the conference.

ANNUAL MEETING.

The suggestion has been made that should the annual show be continued it would be better to have the annual business meeting of the association some time after the New Year. The rush to get through a lengthy programme, see the exhibition, attend committee meetings, and, in many cases, place and look after exhibits, has become so great that one or other of these objects must suffer. Many of the other Associations have adopted the above plan, holding their show and lectures at one time and the business meetings at another.

Very good reasons can be shown in favor of this plan with your association. First, the fruit growers are just beginning to close up one year's work and are not in the least prepared to discuss definite plans for another season; second, as the financial year closes before the heaviest expenditure of the year is incurred (for the annual meeting and show) a false idea of our finances is conveyed to outside parties, including the Minister of Agriculture and other members of the Legislature, as well as to many of our own members; third, owing to the hurried nature of all our proceedings as mentioned above, the business of the association is carried on at irregular hours and undoubtedly suffers in consequence. The above change might very well be brought before the general meeting and thoroughly discussed preparatory to making the change another year. According to our present constitution, the date of the annual meeting shall be decided by the association from year to year.

In closing this report your executive desire to thank you as directors, for the interest you have shown in the various schemes taken up during the year.

Respectfully submitted on behalf of the executive,

P. W. HODGETTS.  
Secretary.

TREASURER'S REPORT 1905-6.

<i>Receipts.</i>	
Balance on hand October 31, 1905 .....	\$ 924 32
Fees .....	293 55
Horticulturist .....	2 47
Show .....	482 52
Legislative grant .....	1,800 00
County Councils .....	110 00
Sundries .....	12 40
	<hr/>
	\$3,625 26

<i>Expenditures.</i>	
Show .....	\$1,010 08
Horticulturist .....	453 33
Annual Meeting .....	295 83
Committees .....	282 70
Postage .....	55 47
Audit .....	8 50
Salaries .....	300 00
Incidentals .....	211 07
Balance on hand October 31, 1906 .....	1,008 28
	<hr/>
	\$3,625 26

## DETAILS OF EXPENDITURE.

<i>Show:</i>	J. H. Dunlop, Treasurer of Exhibition, 1905, \$200.00, 1906, \$300.00; P. W. Hodgetts, \$61.70 (express, \$22.10; cartage, \$5.75; labor, \$18.00; paper, napkins, plates, etc., \$15.85); Bryant Press, County Prize Lists, \$5.50; J. Curtis, printing cards, \$4.00; Brown Bros., Judges' Entry Books, \$21.75; Canada Stationery Co., Prize Lists, \$4.00; Model Cartage Co., \$24.50; Toronto Cold Storage Co., \$44.45; C. M. Henderson, Auctioneer, \$8.60; A. McNeill (expenses of County Prize Scheme, 1905), \$23.95; printing, etc., \$4.90; labor, sending out Prize Lists, etc., County Prize Scheme, 1906, \$10.85; refund County Councils (prizes unawarded), \$73.55; prizes, \$37.00; express and freight, \$30.26; refunds for fruit sold, \$103.57; T. B. Rivett, assistant at show, \$22.00; Methodist Book Room, printing Prize Lists, \$24.50.....	\$1,010.08
<i>Horticulturist:</i>	Periodicals for members, \$219.30; calls on stock held by Association, \$200.00; legal expense drawing up agreement, \$14.63; index, 1904, \$19.40 .....	\$453.33
<i>Annual Meeting:</i>	Travelling expenses, A. N. Brown, \$34.00; G. C. Caston, \$7.50; R. B. Whyte, \$18.10; T. H. Race, \$14.50; A. E. Sherrington, \$9.35; E. Lick, \$7.60; Thos. Beall, \$9.30; Wm. Rickard, \$7.75; Jas. S. Scarff, \$12.25; C. W. Vanduzer, \$8.50; H. H. Groff, \$11.60; M. Pettit, \$6.35; A. M. Smith, \$10.25; W. H. Bunting, \$13.65; W. H. Dempsey, \$7.83; J. L. Hilborn, \$17.80; H. Jones, \$11.70; A. D. Harkness, \$15.80; Methodist Book Room, programmes, \$10.75; W. B. Varley, reporting, \$50.00; H. B. Cowan, lighting and heating hall, \$11.25 .....	\$295.83
<i>Committees:</i>	Travelling expenses, Robt. Thompson, \$5.25; W. H. Bunting, 1905-6, \$80.75; A. W. Peart, \$4.50; Jas. Scarff, \$45.45; M. Pettit, \$13.50; A. D. Broderick, \$17.00; T. G. Bunting, \$19.75; W. D. A. Ross, \$10.10; D. Johnson, \$17.20; A. D. Harkness, \$12.60; T. H. Race, \$15.05; A. B. Foran, \$4.60; Harold Jones, \$36.95 .....	282 70
<i>Postage:</i>	Mrs. Hubertus, \$52.00; cash, \$3.47 .....	55 47
<i>Audit:</i>	J. M. Duff, \$8.50 .....	8 50
<i>Salaries:</i>	P. W. Hodgetts, \$300.00 .....	300 00
<i>Incidentals:</i>	C. Gripton, rubber stamp, 80c.; Bell Telephone Co., \$2.05; Library Bureau card index, \$4.20. T. H. Race (organizing Associations), \$93.20; Horticultural Exhibition (one-half page ad. in Prize List), \$11.00; Bank of Commerce, exchange, 75c.; G. N. W. Telegraph, \$1.09; Methodist Book Room, printing and stationery, \$39.25; Jas. Dorman, office assistance, \$5.00; Miss A. M. Fox, stenographer, \$40.00; Curran Bros., printing, \$4.60; Brown Bros., binding, \$1.75 .....	\$211 07

Examined and found correct, this 2nd day of November.

(Signed) J. M. DUFF,  
Auditor.

## PRESIDENT'S ADDRESS.

By JAMES SCARFF, WOODSTOCK.

My first duty to the members of the Ontario Fruit Growers' Association is to sincerely thank you for the honor which you conferred on me one year ago in my election to the responsible position as President of this Association, notwithstanding my inability to fill such an important and responsible position with such ability as my predecessors. However, I am free to confess that with the assistance I have received from my co-directors, a great deal of good work has been accomplished during the year; and I take this opportunity of expressing my sincere thanks to them and more particularly to the members of the Executive, for the very valuable assistance I have received from them during my term of office.



I am pleased to congratulate the officers and members of the Association on a successful year's work, and I believe our work is of the greatest benefit to the fruit growers of this country.

Our finances, as you will see by the Treasurer's report, are in a good and satisfactory condition. This year has been one of special progress for our Association, and the financial statement shows a good balance in hand, which reflects credit upon the management of the Executive.

The fruit crop of 1906 has been fairly good over the Province generally. The demand for Canadian fruit has been greater than ever, and prices decidedly firmer. The trees and vines have matured an abundance of excellent wood, making the prospect for next year's crop a good one. I regret that I am unable to give a full report in regard to the past season's crops, not having the opportunity to gather any reliable information from the various sections of the Province. The season opened with an extraordinary show of bloom, but in many cases the bloom did not set owing to cold and continuous rains during the blooming season.

The apple growers in some localities report a good yield, others light. Storm and insects during the latter part of the season have depreciated the supply of marketable fruit. Reports from British markets indicate that both American and Canadian apples for export are moving slowly. So far only 60 per cent. has left the Atlantic ports up to the same time the last two years, and the indications are that prices will be satisfactory, and good prices are now being paid growers for well packed stock of the best quality. About the middle of October, frost and a heavy snowstorm did some damage to fruit orchards in some localities in Ontario and in New York State.

I had the pleasure of attending the Dominion Conference in Ottawa, on March 21st and 22nd, where about 100 delegates were present. This conference was successful to a remarkable degree in settling many vexed questions of national interest. The meeting was thoroughly representative of the fruit interests of Canada, delegates being present from Prince Edward Island to British Columbia.

The convention was opened by Mr. J. A. Ruddick, Dominion Dairy Commissioner. After a few words of welcome, he called on Hon. Sydney Fisher to take the chair for the rest of the session. The honorable gentleman was given a very hearty reception. In opening, he pointed out the purpose of the convention as having been called to discuss matters of a national significance affecting the fruit industry, suggesting as to whether it would not be advisable to form a Dominion Fruit Growers' Association. He also submitted to the delegates' attention the question of the Fruit Marks Act, which, while working satisfactorily for the benefit of the trade, had many obstacles to its full operation. He then referred to the need of a definition of a second grade of fruit, and would be glad to receive suggestions. After mentioning several other matters, the Minister submitted them to the meeting, stating that their decision would be a guide in framing and passing suitable legislation to further promote the interest of the trade.

Several committees having been appointed, statistics of the fruit industry in the various provinces were then presented by Mr. A. W. Peart, of Burlington, Ontario; Mr. Jack spoke for Quebec; Rev. Father A. E. Burke, for Prince Edward Island; Mr. Goodfellow, for Saskatchewan; Mr. Starr, for Nova Scotia; Mr. Manson, for Manitoba; Mr. Gilman, for New Brunswick, and Mr. Martin Burrell for British Columbia. Mr. Burrell stated that British Columbia had increased its fruit growing industry 500 per cent. in the last five years. Mr. A. W. Peart submitted an excellent report contain-

ing statistical information relating to almost all branches of the fruit industry in Canada. Considerable time was devoted to the consideration of the gathering of fruit crop reports.

Mr. Saunders, Director of Experimental Farms, gave a very interesting report on growing fruits in Manitoba and the North-west Territories. Excellent addresses were delivered by Sir Frederick Borden and Dr. James Robertson.

Two very important decisions reached were those relating to the adoption of a "fancy" grade for apples, and the defining of a No. 2 apple. The resolutions relating to crop reports, railway regulations, and the development of foreign markets were also of great importance.

The liveliest discussion of the Conference was in regard to the proposed amendments to the Fruit Marks Act. You will find a very full report of the discussions which took place in the official report, which may be obtained on application to the Department of Agriculture at Ottawa.

Many regrets were expressed that provision was not made for the conference to last at least a full week. On the whole, the gathering was a decided success.

The exhibition of fruit, flowers, honey and vegetables exhibited in Massey Hall last year was perhaps the best exhibit of Horticulture that has been held in this Province, and no better means of advertising the horticultural resources of our country than this exhibition could be devised. The number of entries were more than double the number made in the previous year, and in only one respect was this exhibition disappointing, that of the attendance of the citizens of Toronto. On this account the receipts were much less than it was hoped they would be. However, every dollar of expense connected with the exhibition was paid in full without the managing committee being required to appeal to the Government for any further financial assistance.

The exhibit of fruit was much larger than in the previous year, and the quality was much superior, and, without a doubt, it was one of the finest exhibits of fruits ever held in Canada. So numerous were the entries and so close the competition that it took the judges two days to complete their work. Special mention is due to Mr. W. T. Macoun, of the Central Experimental Farm, Ottawa, for his excellent exhibits of 115 plates of apples and 20 of grapes. The Algoma, St. Lawrence, Trenton, Lake Huron and Simcoe Stations were well represented by large collections. The Ontario Agricultural College, of Guelph, exhibited a large collection of insect and fungus diseases, weeds, apples, etc.

The County exhibits added greatly to the appearance of the show, and proved valuable from an educational standpoint, eight Counties being represented.

The results of co-operative work in Ontario, a subject which has so frequently been discussed in many of our former meetings, is one of the most encouraging signs of progress in the development of the fruit industry in our Province. The success which this year has attended the work of the various co-operative fruit growers' associations has been remarkable. Reports of these operations will no doubt be presented for your consideration during the progress of the Convention.

The special committee appointed to consider the revision of the Constitution and By-laws (see pages 108-110, Report of 1905) are submitting a report recommending many important changes for your consideration.

In conclusion, I call your attention to the program which has been prepared for this series of meetings, and express the hope that the members



may feel well repaid for any personal sacrifice they have been obliged to make in order to be present at this busy season of the year, and I also wish to congratulate you upon the excellent exhibition now in progress in Massey Hall.

### COMMITTEES.

The following committees were appointed:—

*Nominating Committee*: Messrs. W. H. Bunting, H. H. Groff, W. M. Orr, W. H. Dempsey, G. C. Caston.

*Committee on Fruit Exhibits*: Messrs. W. T. Macoun, H. L. Hutt, E. Morris, W. H. Dempsey, M. Pettit.

*Committee on Resolutions*: Messrs. W. L. Smith, Harold Jones, H. H. Groff.

### THE GUARANTEEING OF NURSERY STOCK.

The matter of securing a guarantee of nursery stock was introduced by Mr. G. A. Robertson, of St. Catharines, who stated that the grievance had been mentioned at the Dominion Conference at Ottawa, but that it was found it could be dealt with only by means of Provincial legislation, and it was thought better to leave it to the Provincial organizations to dispose of. He stated that he had, in common with many other growers, suffered serious losses by having had supplied to him trees that proved, after years of cultivation, spraying, etc., to be untrue to name. When he had ordered Elbertas, for example, there had been shipped him a white fleshed peach that would not ripen before snowfall. He was of opinion that buyers of nursery stock should also have assurance that the scions had been obtained from producing trees, and as to where the seeds used for raising the stock had been procured, that is to say, whether they came from healthy stock or from the canning factory.

Mr. W. W. FARLEY stated that what was called for was pedigreed stock.

Mr. ROBERTSON: I am certainly an advocate of so-called pedigreed stock, but unless the growers are first educated in regard to it and demand it, the nurserymen will never offer it to us.

Mr. CASTON: So far as apples are concerned, my advice to growers is to pedigree stock themselves. This may be done by first selecting suitable varieties for stock and then topgrafting from the best trees in the neighborhood.

Mr. HAROLD JONES stated that while in his opinion it might be practicable to obtain legislation requiring nurserymen to guarantee stock true to name, he did not see how it would be possible to provide for a guarantee as to the quality of the root stock or the scions.

Mr. ORR: We could not control trees received from the United States, and I doubt very much whether we could control our own nurserymen. I think that if our people would support our own nurseries they would get better stock, as we have many good reliable men in the business. If we had done so in the past, we might have avoided the greatest curse in the way of insect pests that has ever visited this country, namely, the San José scale. Of the grapes I have planted I do not know that I ever had a vine that was not true to name. The apples have been true to name. In peaches there are perhaps one to two dozen trees among those I have brought to bearing that are not. If we go to responsible nurserymen, we can now pretty well depend on our stock. If we buy from peddlers, we must expect to be taken

in. I should be very glad indeed if nurserymen could fully guarantee their stock. They do guarantee it now; that is to say, they guarantee to replace it if it is not true to name. Of course it is a great loss to the grower in the meantime, but I do not see how we could obtain any further redress.

Mr. M. PETTIT: An explanation as to how the mistakes occur to which Mr. Robertson refers. I was in a nursery some years ago and remember seeing the owner filling an order from a block of Baldwin apples from which he was selecting all sorts of varieties.

Mr. PEART: As a fruit grower I can see the difficulties of the nurseryman if asked to guarantee absolutely that every tree he turns out is true to name. With thousands and tens of thousands of young trees he cannot personally supervise every one of them, and it is unavoidable that sometimes there should be mistakes. I have bought a good many thousands of trees, and not more than five per cent. have been untrue to name. If the nurserymen will replace the varieties that are not true or will topgraft them or replace them in some way, I think it is all they can be expected to do.

Mr. RICKARD: I have been in touch with a great deal of planting of apple trees, and I think there is practically no loss from these trees not being true to name; but while they are true to name, they may be wrong in every other way.

A MEMBER: In my part of the country it makes comparatively little difference as regards apple trees whether they are true to name or not, as they can be topgrafted very early from some other variety in the orchard. As regards peaches, the grower has little trouble in growing his own young trees and getting his buds from trees that are of known character. By this means he can tell exactly what strain he is budding from.

Mr. CASTON: There can be no doubt that jobbers impose a great deal on the public, and have been the cause of great financial loss. At the same time reputable nurserymen may generally be relied upon in this matter. Our object should be to regulate the jobbers and other irresponsible parties. Nearly everything I have got in a commercial way from nurserymen has been true to name, and I have no fault to find with them personally.

Mr. HILBORN: I have had a lot of experience in buying peach trees, and, on the whole, the American stock we have bought has been more satisfactory than that purchased in Canada. There has been a great deal of damage done in the western district through the sale of spurious and weak stock, and a law to control this matter would be desirable.

Mr. W. L. SMITH stated that he had been over the whole of Ontario within the last few years, and that in almost every community where fruit growing is carried on he had heard complaints about trees not being true to name, all of which did not come from irresponsible agents. He mentioned a case in South Simcoe where about one-fifth of the trees obtained from one of the largest nurseries in Canada proved wholly valueless. Where such cases occur, he thought that a reasonable penalty should be imposed, just as a reasonable penalty is imposed on growers when their fruit does not prove true to the description on the label. To require nurserymen, in the event of stock not being true to name, to topgraft it, was an insufficient remedy. Five to eight years would pass before the evil was discovered and then to topgraft or to offer another lot of young trees as an equivalent was altogether out of proportion to the damage and loss sustained by the grower.

Mr. ARMSTRONG: I have been a great loser on account of spurious nursery stock bought from reliable Canadian growers and from the best firms in Ontario, and I regard the question as a very serious one.

Q.—Did you buy your trees directly from the nursery or from jobbers?

A.—Directly from the nursery.

2 F.G.



A MEMBER: Jobbers often change the name to suit the purchaser.

Mr. L. A. HAMILTON: Four years ago I began planting trees, and was altogether unfamiliar with the fruit business. The result was that I went to one of the best men in the country and explained what I wanted, telling him that I wanted the best stock he could give me, in fact I placed myself entirely in his hands. When the trees came and were planted, my man stated that they were very poor stock indeed, being twisted, gnarled and poorly grown. It is too early yet to see whether they will prove true to name or not, but I shall be agreeably disappointed if they do.

On the motion of Mr. ROBERTSON, seconded by Mr. ARMSTRONG, the following committee was appointed to investigate and report upon the proper production of nursery stock from healthy stock of bearing quality and true to name: Messrs. Macoun, Robertson, Orr, Jones, J. L. Hilborn, Farley and Johnson.

#### REPORT OF COMMITTEE.

Later the following report was presented:—

Your committee appointed at the morning session of the Ontario Fruit Growers' Association held at Toronto on Wednesday, November 6th, 1906, beg leave to report that:—

1. It is a fact that much of the nursery stock planted in years past has been of inferior quality and untrue to name, and as a result the growers who planted such stock have suffered in many cases severe financial loss as well as great inconvenience.

2. That a considerable quantity of the stock which has proved untrue to name, has been purchased from irresponsible agents and unreliable firms, but that the self-styled reliable nurserymen are not all exempt from this practice.

3. That much of the blame and dissatisfaction caused has been shouldered on the nurserymen situated in the United States, but that geographical situation is not wholly accountable for this, as there are reliable as well as unreliable nurserymen in the United States as in Canada.

4. That trees be produced true to name and sold to these growers who desire such trees under a written guarantee, and that this guarantee means that the nurserymen be held responsible if trees are not up to the guaranteed standard.

5. That the nurserymen may supply to those who desire them, trees which, on account of their cheapness or first cost, will satisfy the demands of intending purchasers, but that for the quality of which, as now, the nurserymen will not be held responsible.

6. That in the case of a dispute between any grower and nurseryman, if action be taken, the matter be settled in the court nearest the home of the fruit grower so wronged.

7. That the matter of propagation of nursery stock from the proper root stock, budded or grafted with buds or scions from healthy trees of good bearing quality of the true type of the variety, be left at present in abeyance, and that this association procure a competent speaker from the United States or elsewhere to give an illustrated lecture on this subject at our next annual convention, and that we use every effort in the endeavour to inform the fruit growers of the advisability of such a method of propagation which will in time create a demand which the up-to-date nurseryman will supply.

## NEW VARIETIES.

BY PROF. H. L. HUTT, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Comparatively few new fruits have been sent to us this year for examination. But we have been doing more work than usual at Guelph in the way of originating new varieties. Many of these fruited for the first time during the past season.

We have at Guelph 120 seedling strawberries which are crosses of some of our best varieties. Among them we have some very promising new kinds coming on. I shall not refer to any of them at the present time, however, as we desire to give them a few years' trial before introducing them as something new. We also have some promising raspberries.

Some time ago we obtained scions from an English apple of high reputation in the Old Country, known as Cox's Orange Pippin. These were top-grafted on a young Tolman tree. The tree bears heavily; the fruit is handsome and of exceptionally high color, but it is subject to spot.

Q.—What is its season?

A.—Fall or early winter.

Q.—Are your topgrafts healthy at Guelph?

A.—Very, the tree is strong and vigorous. I do not think that this apple will do well in the northern parts of the Province, but it will be all right in the southern part.

Q.—Is it subject to spot in England?

A.—I do not know as to that.

Q.—It is a very slow grower, is it not?

A.—It is a slow grower.

Another variety of apple to which our attention has been called is the Minkler, which originated in the State of Illinois. The tree is hardy, vigorous, and productive. It is a long keeper, keeping with the Stark, and of good size and color.

A MEMBER: That is one of the varieties that Mr. Huggard, Whitby, has been recommending for some time.

Prof. HUTT: Yes, and I think it is an apple that is well worth our further testing.

Q.—Have you tested the Spencer Seedless?

A.—Our committee has not yet had an opportunity of reporting upon it. However, until our Experiment Stations have a chance of thoroughly testing it, I think growers should go very slow in planting it.

Mr. GROFF: I think it is in the interests of the orchardists that this variety should be investigated by this Association in its corporate capacity so that the less informed public may not be misled concerning it.

Mr. MACOUN: I had an opportunity of testing this apple yesterday afternoon. I ate one specimen, and the quality was between that of Baldwin and Ben Davis, but the apple was in a somewhat over-ripe condition. It is rather attractive in appearance. The calyx is very open, however, and you can see almost to the centre of the apple from that end. On cutting the apple open, you find a slight mildew-like appearance along this tube, which gives a very unattractive appearance to the inside of the fruit. The fruit is not altogether coreless, although I did not see any seeds. Judging from reports of reliable men in the United States, I would not recommend anyone in this country to plant trees of this variety, because I do not think it will have any commercial importance here.

Mr. A. D. HARKNESS, Iroquois: There have been seedless apple trees growing in my county for several years, and they are now of large size; one



of them would not stand in this room. They bear a very light crop, however. The description is similar to what Mr. Macoun has given, except as to color. The quality is a little more acid, and they are also more juicy than the Ben Davis, but otherwise they are no better. The trees I refer to are large enough to bear from two to three barrels a year, but if the owner gets half-a-dozen or a dozen apples from each of them he thinks he is getting quite a crop.

Q.—Where did he get the trees?

A.—He bought the trees from an agent as seedless apples, and the conclusion he has come to is that they are absolutely seedless.

MR. MACOUN: This apple was first brought to the attention of this association by the late Mr. Whitney, of Iroquois, five or six years ago. I visited Mr. Cameron's orchard two years ago, to which the last speaker referred, and Mr. Harkness sent me flowers from this tree. The tree bears flowers such as are attributed to the Spencer, that is to say, there are no petals and it is necessary for some other tree to pollinate the apple in order to grow fruit. This may be the reason for the failure of this tree to bear.

MR. W. L. SMITH: It seems to me that if this association has any purpose at all, it is to protect the innocent grower, and I would recommend that we should have a special report on this apple.

MR. MACOUN: *The Canadian Farm and Home* quotes the following opinion of Prof. Van Deman, formerly Pomologist to the United States Government:—

Prof. H. E. Van Deman writes to the *California Fruit Grower* that any statement to the effect that the man Spencer "evolved" the "seedless" apple by a mysterious process after years of careful experimenting, is "a lie, pure and simple." The truth of the matter is, according to Prof. Van Deman, that Chas. Waters, a brother-in-law of Spencer, got scions of the variety from Virginia in the fifties and propagated trees from them in Wisconsin, but concluded that the trees were too tender for that part of the country. He moved to White Salmon, Wash., in 1884, but had sent scions of the variety to his son-in-law, A. H. Jewett, in 1879, and when the trees bore, the fruit was so poor that nearly all the trees were at once dug up and destroyed. Waters went to Grand Junction, Colo., in 1890, and took with him some of this "Waters' Seedless Apple," as he called it, and gave them to John F. Spencer. That is where Spencer got the stock for the wonderful new discovery which he is advertising as a revolution in apple growing. Waters states that he knows that Spencer propagated trees from the scions he gave him, for he stayed there several years and saw it done. The original Spencer Seedless Apple Co. claims to have 17 sub-companies. Prof. Van Deman writes that an attempt is being made to have the post office department issue a fraud order against them.—*Country Gentleman*.

MR. GROFF: The fact that this apple has been termed seedless creates the erroneous impression that it is also coreless. To my mind it is a matter of secondary consideration as to whether the apple is seedless or not, but from a commercial point of view it is desirable that it should be coreless.

MR. CASTON: It does not appear to me that it matters whether the apple has seeds or not. It lacks quality, and if it has not quality it is no good. The public looks to this association for information of this kind. \$2.50 is a pretty high price to pay for an apple tree, which, I understand is the price asked for the Spencer Seedless, and we do not want to spend money on a humbug.

It was resolved on the motion of Mr. MURRAY PETTIT, seconded by Mr. DEMPSEY, that Messrs. Groff, Macoun, Morris, Johnson and Dempsey be appointed a committee to report on the variety to the meeting.

## REPORT OF NEW FRUITS COMMITTEE.

By W. T. MACOUN, C. E. F., OTTAWA.

There were fewer good, new fruits brought to our notice this year than usual, but some interesting and promising seedlings have fruited at the Central Experimental Farm, most of them for the first time.

The cry from the colder parts of the Province of Ontario for a winter apple of high quality and fine appearance must still go unsatisfied, but we believe that it will not now be long before we shall have an apple which will fill this long felt want. The extremely severe winter of 1903-4 killed out many varieties of apples at Ottawa, but the lessons learned from that winter have been of the utmost value, and should save many thousands of dollars to those who are planning to plant apple trees in those parts of the country where the climate is similar to what it is in Ottawa. One of the facts which was brought especially to our notice after that winter was that it was the trees of varieties which ripened their wood early which came through in the best condition. An early ripening tree means, in our experience, a tree which ripens its fruit early, hence most of the hardy varieties prove to be summer and fall sorts. But there are exceptions, and we have found that in some cases the trees mature early and the fruit is in condition for eating in late fall or early winter, yet the fruit will keep practically all winter. In other words, the texture of some apples does not break down as soon as others, even though they become fit to eat at the same time.

It is this early maturing but long keeping apple which will give us the tree hardy enough to withstand a test winter. Some winter varieties of this character which withstood the test winter at Ottawa are Winter Rose, Stone, Calumet, Scott Winter, Milwaukee, La Victoire and Baxter. None of these apples, however, are quite what is desired. The Winter Rose is an apple of good size, of fair appearance and good quality, but has not sufficient acidity for a winter apple. The Stone is of much the same character. The Calumet is an attractive looking apple, but not even enough in size nor quite good enough in quality. The Scott Winter is too small, and is not good enough in quality. The La Victoire comes nearest being an apple of the desired type, but lacks juiciness. The Baxter is a very large, handsome apple, but somewhat coarse. Since the winter of 1904, however, when it proved so hardy, we consider it a desirable apple for planting in the North. All of these varieties were originated in the North.

As was stated here last year, we have at Ottawa a collection of very promising seedlings which have been sent in by persons who have originated them. As these are being tested as standard trees rather than top grafts, they are longer coming into bearing, but our own seedlings, raised from the best apples fruited at Ottawa, are now fruiting in considerable numbers. Out of eighty-four which we have described, consisting of seedlings of Fameuse, McIntosh, Swayzie, Wealthy, Scott Winter, Winter St. Lawrence, and Dorkham Russet, twenty-one have been considered sufficiently promising to propagate for further trial, so that if this proportion, which is 25 per cent., of promising apples is maintained through the 2,000 apple seedlings which are being grown we should have about 500 promising varieties to select from. In addition to these, a number of promising crosses have fruited, and many Russian seedlings also. There is a temptation to disseminate some of the best of these, but we believe that even though it takes a long time it is best



to thoroughly test a variety before recommending it, as there are too many kinds on the market already.

It is interesting to note among the seedlings which have fruited the more or less resemblance in most cases to the female parent and to the probable male parent or the tree growing near that from which the fruit was taken in the orchard. This is particularly the case in regard to the seedlings of Wealthy and Swayzie Pomme Grise. Near the original tree of Swayzie is a tree of Baxter. The large size of the Swayzie seedlings and the large dots on the skins show the Baxter blood, and in one instance a large Swayzie seedling looked very much like Baxter in outward appearance. The Wealthy seedlings nearly all have that smooth, symmetrical surface peculiar to the parent, and in some instances the seedlings have been quite crablike, showing the crab origin of the Wealthy, as claimed by Peter Gideon, the originator of it.

Some good grape seedlings fruited this year, the seedlings of Brighton being particularly promising. One of these, a black seedling, almost identical with Brighton in flavor, but a finer grape, will, we believe, be an acquisition.

There are two new apples which have been fruiting at Ottawa for several years which we would like to draw your attention to. These are the Walter and the Hoadly. They are both about the season of Wealthy, but have proved very hardy and have merits of their own.

*Walter*: Originated by the late P. C. Dempsey. Fruit roundish, rather irregular; very large; cavity deep, medium width; stem short, moderately stout; basin deep, medium to open, almost smooth to moderately wrinkled; calyx open; color greenish yellow, splashed and streaked with red; dots few, small, white, distinct; skin moderately thick, moderately tender; core small; flesh yellow, rather coarse, juicy, melting, subacid; flavor pleasant, high; quality good; season October.

*Hoadly*: Originated in Wisconsin. Fruit oblate; size above medium; cavity deep, moderately open, slightly russeted; stem short, slender; basin medium depth and width, almost smooth to slightly wrinkled; calyx open; color yellow, splashed and streaked with carmine; dots few, yellow, indistinct; skin thick, moderately tender; flesh yellowish with traces of red, juicy, rather tender, briskly subacid; pleasant flavor; core medium; quality above medium; season October. Tree an upright grower, hardy and productive. Scions obtained from the late J. L. Budd, Ames, Iowa, U. S.

MR. MORRIS: The object of this committee is to report on fruits that are considered worth disseminating. I had many seedlings sent me last season in the course of my business, particularly in peaches. Some were really good, but they came at a season of the year so close to others, or they were so similar, that I did not think there was any place for them. I never yet received a specimen of an apple, unless it was Laxelle, that I considered worthy of a place in an orchard. I think that Laxelle will be a valuable apple in the north. With regard to Cox's Orange, we hardly consider it a valuable apple in a commercial way except for near-by markets. If picked when ripe it would spoil by the time it reached the English market. It does not spot with us. The Mingley scarcely colors with us, and I do not think it would color in northern sections.

MR. GROFF: I should like to take emphatic exception to Mr. Macoun's remarks in regard to the desirability of any chance work in plant breeding as compared with the more modern, efficient and scientific process of selection. My experience in my line of breeding enables me to see that it is applicable to every branch of plant breeding. The only way whereby we can hope to progress to any length and lay a foundation of more valuable

material on which to work is by the scientific selection of the parents which we cross. By the chance method suggested by Mr. Macoun, it is impossible to keep an absolute record of such crosses. It is not desirable, for the reason that in cross-breeding it is not possible to produce identical results by the repetition of the same crosses.

MR. MORRIS: With regard to the production of new varieties, and the methods followed by Mr. Burbank, I do not know of a single new fruit produced by him that equals the old established kinds. He has produced numberless varieties and crosses from Japanese plums, but not one is equal to the two kinds that came originally from Japan. My advice is this: If you have an odd apple tree away from the rest of the orchard, graft two or three kinds on that tree, and when they begin to bear, plant the seeds from them. It is a simple and easy method. Get a strong, hardy kind as a foundation, such as McIntosh, Baldwin, or Baxter, so as to give the tree strength and constitution. The seedlings from an isolated tree will either come true to name, or else they will represent crosses of the different varieties grafted on the tree.

MR. GROFF: This will not prevent the reversion of seedlings to the original type. The proper condition of control can only be arrived at by many crosses and proper selection for many generations. When you get your material in a condition of control there is no difficulty in securing any quality you may desire by breeding from the proper parents—flavor, texture, color, size, early or late season—these things are absolutely under the control of the hybridist. Further than that, the results of this work, carried on extensively—I speak of the result of over half a million of offspring bred in this selected way—is beyond the grasp of the human mind. Progress has been so marked as to warrant me in saying that this is the proper method of producing new varieties. Mr. Burbank's failures have been because he did not specialize. He has done too much superficial work.

MR. MACOUN: I agree with Mr. Groff perfectly that, under his conditions, better results will be gained from intensive work. In the case of the apple, where it takes so many years before a variety can be properly tested, I think we should carry on a certain amount of this rough and ready work, while other more scientific lines are being followed. I agree that under Mr. Groff's method, results may be controlled, but in dealing with tree fruits like the apple, we have to wait a long time before we know what the result is, whereas, Mr. Groff in his work obtains results in one season. I may say that at Ottawa we are getting good results from the method I have suggested—that is to say, twenty-five per cent. of our chance seedlings are sufficiently promising to warrant us in retaining the trees. I think we can get a larger proportion of good results in this way, in the line mentioned, than by any other method.

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#### THE SPENCER SEEDLESS APPLE.

Your committee appointed to examine into the claims made for the Spencer Seedless Apple, beg leave to report as follows:

We secured specimens from the exhibit at Massey Hall which showed the following objectionable characteristics in apparent contradiction to the printed description:

Although the core is smaller and less distinct than in the average apple, there is still sufficient to make the process of coring a necessity.



The practical absence of the calyx tube leaves an abnormally large and deep opening reaching to the core, thereby involving loss of flesh nearly equal to a normal core, as well as affording a harbor for injurious insect pests.

The specimens examined by us showed this space to contain an objectionable mould-like accumulation. They also gave well developed seeds, though fewer than the normal apple.

As to size, the specimens seen by us were about equal to our Fameuse or Snow, and those tested for quality and flavor were about equal to the Ben Davis.

We believe that our inspection warrants the advice that the trees of this apple should be purchased only as a curiosity.

The local representative of the company, who was present, said: I have been accorded the courtesy of making a few remarks in reference to the report brought in by your Committee on the Spencer Seedless Apple. The firm that is interested in handling this apple in Ontario has made an exhibit of this entirely new and distinct variety of fruit at the Horticultural Exhibition here in order to give the public fully and frankly all the information there is to be had bearing on the matter. I understand that your committee submitted its report to this association this morning. I have not had an opportunity of examining it except what has appeared in the *Toronto Daily Star* in reference to it. To the statements appearing in the press, we desire to take a few exceptions, based on the lack of information at the disposal of your committee. We are informed that the committee called at the exhibit, but that they did not make themselves known, and consequently some explanations which they should have had were not given them.

First, it is stated that "although the core is smaller and less distinct than in the average apple, there is still sufficient to make the process of coring a necessity."

On this point I desire to say that the function of a core is to protect the seed. The Spencer seedless apple being without seed, there is no longer this function for the core to perform. For that reason the core is not developed, but the cells are thin and paper-like, and by a process of nature are taken up by absorption. By the time the fruit is ready for eating, which is about the month of March, the presence of the core is no longer evident. After producing the first seedless apple, Mr. Spencer continued his experiments and by a process of careful selection, budding and grafting was able to produce an apple that eliminates the necessity for a core, and at the time the fruit is ready for consumption the core has disappeared.

"The practical absence of the calyx tube leaves an abnormally large and deep opening reaching to the core, involving loss of flesh and affording a harbor for insect pests. The specimens examined showed this space to contain an objectionable mould-like accumulation. They also gave well developed seeds, though fewer than the normal apple."

In regard to this matter I have only to say that the same process of careful selection in budding and grafting that I referred to above, has enabled Mr. Spencer to produce in his last generation of tree an apple that is no more open in this respect than is an ordinary apple. The fruit specimens from this last generation of trees are limited on account of the trees not being in full bearing. The supply of fruit for this exhibition came from the home orchard at Grand Junction, Colorado, and most of the apples were from the older trees, but we also have some of the more recently developed specimens,

which we are ready and anxious to show to anyone visiting the exhibit. In these specimens the calyx is so nearly closed that it is very little different from the ordinary apple.

To allay any suspicion of fraud, and to assure the public of our genuineness, we have taken this opportunity of exhibiting the fruit in order that they may see the merits of the apple. We freely cut the apple open before the public and give them an opportunity of tasting it. The unanimous opinion is that the apple compares with the Baldwin in quality and texture. It is also a splendid keeper.

With reference to its seedless character, I may say that out of one hundred specimens cut, we found but one seed. In this respect the apple is very similar to the seedless orange, in which fruit you will come across an occasional seed also. The reason for this is that where the branches of these trees interlace with those of seed-bearing apples you will occasionally find that a seedless specimen has been fertilized by a seed-bearing variety, and on that account we occasionally find a seed present.

Hon. John Dryden made a trip to investigate this apple and the business methods of the parent company. His integrity no one can question. He made a full and unprejudiced report, and it is worthy the attention and consideration of every fruit grower in the Dominion. I may say further that the company operating in this country has no connection whatever with the parent company, except that it has obtained the right to grow these trees here.

MR. GROFF: As chairman of the committee, I should much prefer that the whole report be read in order that the description of the apple as we found it may be thoroughly understood by those present. There is no intention on our part to say anything that is unfair to the concern handling the Spencer seedless apple. At the same time it is the proper thing that we should report both as a committee and as an association exactly what we believe the facts of the case to be.

This gentleman states that he has found a very limited number of seeds in the apple. Our committee found three seeds in two apples.

After the report had been read by the secretary, the representative of the Spencer Company stated as follows: "We do not contend that the apple is absolutely devoid of seeds at all times, for the reasons I have already given, but we claim that we have an apple the nature of which is to be seedless, and if not contaminated from outside influence, a seedless fruit will be developed."

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## THE DOMINION CONFERENCE OF FRUIT GROWERS AND ITS IMMEDIATE RESULTS.

By W. H. BUNTING, ST. CATHARINES.

As one of your representatives to the Dominion Fruit Conference at Ottawa last March, I have been requested to give you a short resume of the immediate results of that gathering of representatives from the different provinces of the Dominion. It is not my intention to go into the matter in an exhaustive manner, as the proceedings of the conference have been printed, and for extended details I will refer you to that report, which will give you the addresses, and the discussion that took place. The report is well worth reading by any person who is interested in the fruit industry.



The conference was known as the Second Conference of the Fruit Growers of the Dominion. As many of you are aware, the first conference was held in the same city some sixteen years ago. I did not have the pleasure of attending it, but I believe that matters of a somewhat technical character were discussed, and it was felt then that the result of the conference was of such value that it should be continued from time to time, and an attempt was made to form a Dominion Horticultural Association. Through circumstances which were apparently unavoidable, that organization never succeeded, and until last March no similar gathering was ever held. During this interval great changes had taken place in the fruit industry in line with the progress in other branches. As fruit growers we have extended our boundaries on every side, and in almost every Province in Canada at the present time fruit growing has become an industry of importance. It was felt that, as this Dominion is very broad, and as the interests involved are very diverse as well as important, a gathering of the representatives from the different Provinces once more was not only very desirable but absolutely necessary. With this object in view, the various provincial associations have, during the past few years, been making an effort to attain this object. While I presume that the initiative came from this Association, I think I should fail in my duty if I did not refer to the indefatigable efforts of our modest Chief of the Fruit Division, Mr. McNeill, who was untiring in his endeavor to bring about this conference, and who did so much in the work of organization to further its success. In fact if Mr. McNeill had done nothing else since his appointment as Chief of the Fruit Division (and I think we must all admit that his works are legion), the very fact of the assembling of this conference particularly under his auspices, is a sufficient apology for his existence as administrative officer in the Fruit Division.

The keynote of the conference was a desire on the part of the representatives to get together and compromise as much as possible conflicting ideas and diverse opinions upon subjects likely to be discussed. In this connection Hon. Mr. Fisher in his opening remarks made use of some expressions which I think I shall do well to repeat to you as striking the keynote of the deliberations of the entire conference. He said in part as follows:

"This conference is essentially of a national or of a Dominion character, In every Province of the Dominion where fruit growing is practised, and that means nearly all our Provinces, there are provincial organizations which deal with the conditions and circumstances of the individual Provinces as they effect fruit production. These associations are in existence everywhere, But we have to-day in our fruit industry problems which are international in their character and which overlap from one Province to another, and have to be dealt with on a national basis. It is particularly to this class of problems that I wish to direct the attention of the conference. We have, as you have noted in the list of delegates, representatives from the Maritime Provinces at one extreme, and from British Columbia at the other. Interests are diverse in these different localities, and there may be differences of opinion, but we must try to harmonize these differences, and I trust and believe that you will succeed in doing so. We have had many instances of apparent difficulties in this Dominion, but on frank and free discussion they have disappeared, and we have been able to reach a national expression, embodying the best interests of the country. The previous conference attained that end, and we shall accomplish great good for the Dominion by following in their footsteps."

In giving expression to these remarks, as I said, Mr. Fisher struck the keynote for the deliberation of the conference. While at times there arose

matters which seemed to be of a controversial nature, I failed to hear at any time a note of discord or anything that would appear in any way as bitter or narrow in connection with these discussions. In a letter to me a short time ago in proof of this fact, Mr. McNeill stated as follows:—

“One of the most important results was the breaking down of sectional feeling, which is bound to exist between Provinces so widely scattered as those of the Dominion. Nothing could be more marked than the amelioration of long-standing frictions. In this connection the conference may be said to have risen to the dignity of a nation-builder inasmuch as without this sentiment political union would be of little value.”

To come now to the results of the conference, it is my desire merely to touch upon three or four of the salient features, leaving my colleague to fill in or to elaborate as he may see fit.

The first item of importance brought up was an exhaustive treatise by Mr. Peart on the statistics of the fruit industry. I may say that I was somewhat curious to learn just what Mr. Peart would be able to make of that subject, owing to the difficulty we have in Canada of securing reliable and accurate statistics in reference to the industry. While statistics have been compiled giving data of a certain character, we have felt that we were lacking in a systematic method of securing data for statistical purposes. In coming before any body of business men and presenting to them the importance and value of the industry, we have been at a loss to secure accurate information in this respect. I was very much surprised indeed that Mr. Peart had been able to secure the data he presented. It was exhaustive so far as it could be, and extremely valuable, but it only went to show the necessity of some system, both Dominion and Provincial, whereby accurate information could be obtained. I think that as an association, we should press for that work being forwarded in our own Province, which is the banner fruit growing Province of the Dominion.

The next important matter was a discussion of the Fruit Marks Act. This Act was brought into force largely at the request of this Association, for the reason that complaints had appeared from time to time in reference to the condition of our fruit in foreign lands. The measure has given very much satisfaction and has proved beneficial to the trade generally, as you know. It possessed, however, some weaknesses which it was felt should be remedied. The Minister of Agriculture was anxious that this should be done, but was waiting for some pronouncement from those interested. One of the most serious difficulties was the question of the No. 2 grade. Fruit growers had talked it over from all sides. It had been taken up and laid down, and it seemed to be a very difficult matter to arrive at a definition that would meet with the approval of all concerned. A definition has now been arrived at. While no doubt it will not meet with the approval of every individual, still it met with the approval of the conference and has been accepted by the Government and become part of the law. I am pleased to learn from undoubted authority that the working out of the decision has already proved beneficial, and that whereas up to this year the No. 2 apple was anything at all, it is already taking its place as a commercial product with a definite known value. As the definition becomes better known and as packers and growers educate themselves to the conditions involved, I have no doubt that the No. 2 apples will take a place very little inferior in price to No. 1. The No. 3 grade will then cover a larger portion of the balance of commercial apples, which at the present time is allowed to go to waste in the orchards, or is passed off as No. 2.



Another grade is named "Fancy" to meet the wishes of our British Columbia friends, and also of those growers who are practising improved methods, and who desire to put upon the market something strictly fancy. While we from Ontario and Nova Scotia are objecting to the very strict definition of this grade, which is such as to be almost unattainable, I understand that a certain amount of elasticity is to be allowed in practice when accepting the definition. These were two of the principal points in connection with the Fruit Marks Act that were provided for, and I certainly believe that the near future will show that the legislation in that respect has been wise.

Another subject of great importance to the fruit growers was the adulteration of fruit products. It was shown that to some extent the preparation of fruit products in this Province was not absolutely free from suspicion, and representations were made to the Dominion looking to the placing of safeguards around the preparation of fruits, so that substitutes could not be placed upon the market.

Another point on which it was expected that there would be considerable controversy and probably great difficulty in arriving at a satisfactory conclusion was the question of packages. It has been felt that uniformity was extremely desirable in baskets, boxes and barrels so that no matter from what province they might come, not only would the quality be definite, but the quantity would be definitely and well known. With this in view, efforts were made to regulate the size of the barrel, box and basket to be used. While the question of packages was not finally disposed of, considerable progress was made. The 28 1-2 in. barrel was approved by all present, as was the standard box, 10 x 11 x 20. Some details with reference to one or two sizes of baskets in use in certain sections were not definitely decided, but I desire to say that they are on a fair way of being disposed of, and I understand there has been greater uniformity in connection with baskets this year than ever before. Had it not been for unfortunate circumstances in connection with one or two of our factories in this Province, I think perhaps our baskets would have been almost uniform this year.

The question of transportation has always been a live one with commercial fruit growers. It was taken up and discussed from various standpoints in reference to the express business, the freight service and carriage by water. A great deal of valuable information was brought out and a series of resolutions were brought forward and heartily endorsed, and if the fruit growers of the Dominion are able to succeed in having them made operative, it will result in very great improvement in transportation. We have encountered many difficulties in that respect during the past few years, but we are hoping for better things in the future.

One of the items to which I should direct your attention was the effort on the part of the conference to have the express companies placed under the control of the Railway Commission. When the new Railway Act was passed, and a Board of Commissioners appointed, the express companies by some means escaped being placed under the control of that Board, and it was felt that this was a serious oversight. A committee from the conference waited on the Premier and his colleagues and made a strong effort to have the express companies placed under the control of the Commission, and, as you are no doubt aware, legislation was passed, although at the interview Sir Wilfrid did not give us very much encouragement that he would bring down anything in the way of an amendment owing to the lateness of the session and the pressure of work. However, the representations were so well put and considered so strong that during the session, legislation was brought

in and passed which placed the express companies under the control of the Commission. It now remains for the fruit growers who feel that there are grievances in this connection which should be redressed, to prepare their case and present it before the Commission, feeling assured that they will get an impartial hearing and that justice will be meted out where it is required. A strong committee representing the various provinces was formed with the object of aiding and promoting, from the standpoint of the whole Dominion, facilities for the moving of our fruit to the centres of distribution and placing them in the hands of the consumer in a more satisfactory condition.

Many minor matters were brought up during the two or three days of the conference and every moment seemed to be crowded with business from start to finish. The Minister of Agriculture, before the close of the conference, signified his willingness to make such arrangements as would provide for the assembling of a similar conference every two or three years, and I am sure that this Association may congratulate itself on the effort it put forth to have this conference inaugurated.

I wish to thank you for the honor you conferred upon me in appointing me as one of your representatives. I did the best I could, took part in the discussions, and endeavored to reflect the opinions of the fruit growers in the Province of Ontario as well as I was able.

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## THE DOMINION CONFERENCE OF FRUIT GROWERS—FUTURE POSSIBILITIES.

BY A. W. PEART, BURLINGTON.

Mr. Bunting has given you a very clear statement of the proceedings at the Dominion Fruit Conference last March, but there are two or three features which he did not touch upon to any great extent, and these I shall refer to more fully. I entirely endorse what he said in regard to the spirit shown at that conference. As the delegates were from all parts of the Dominion, there appeared to be during the first day's proceedings a certain amount of Provincial prejudice, and the delegates from each of the Provinces were somewhat inclined to group themselves together, but by the third day of the conference the delegates from different parts of the Dominion were intermingled, and this showed the spirit that prevailed. As business proceeded the feeling became more and more one of unity of purpose and spirit.

With regard to water transportation for fruit, I may say that in the Burlington district we have been in the habit, during the past eight or ten years, of sending perishable products in the shape of pears, plums, grapes, tomatoes, etc., to the Old Country, and have met with very varied success. Some shipments went through all right, while others would scarcely pay their way. We had hoped that as time went on the cold storage arrangements on board ship would become more and more complete, and I think that our experience last August—if you were to compare it with our experience three or four years ago—would certainly show that cold storage is much more reliable and more efficient than it was formerly. In August we shipped Clapp Favorite and Bartlett pears to Glasgow, and they arrived in practically the same condition as they left our orchards. We had gotten into the habit of picking our fruit rather on the green side, and did so this year, with the result that the pears were somewhat too green when they reached



their destination. We feel, therefore, that in the line of cold storage something is being done. I am one of those who think that there is a future before the tomato growers of this country in the business of exporting certain classes of tomatoes. For three seasons I tried to export them, using the variety known as Honor Bright, a firm, late-ripening variety, probably the best in quality of any that I am acquainted with. It met with varying success. One shipment reached Glasgow in good shape and sold at a very profitable price; another shipment was a little off and sold lower; another reached there in still worse condition, and I had to pay the charges. I am in hopes that some of our vegetable experts will give more attention to the production of a new variety of tomato which will be fit for export purposes. The Honor Bright is the best I know of at the present time for that purpose, but it is rather late in the Burlington district. If they could develop a medium-sized, smooth, firm, good quality tomato that would come in two weeks earlier than the one I referred to, it would form a very valuable addition to our varieties.

In regard to insect and fungus pests, this question was also dealt with by the conference. I do not know that anything of a new character was brought to the surface in the way of methods of treatment, but the methods we are already acquainted with were emphasized. I will say that the man who discovers a remedy for the codling moth will earn the personal gratitude of the fruit growers of this Province. In our district I think the moth destroys one-third of the value of the apple crop. I have tried a number of methods of treatment, among them spraying with Paris Green, and sowing the orchard with peas, then allowing the hogs to harvest the crop and incidentally eat the fallen apples, thus destroying many worms. This method is satisfactory so far as it goes, but it is not a complete remedy. I have tried bands and believe they are good if properly taken care of, but if you neglect to remove them at the proper time, you simply furnish homes for the moth and aggravate the trouble. I do not think there is any effective and satisfactory remedy yet discovered which will control the moth.

A resolution in regard to markets and marketing was passed. It was to the effect that the Dominion Government should appoint agents in various foreign countries wherever apples are sent, whose sole duty it should be to open up and exploit those markets in the interest of Canadian orchardists. The question of markets is a very important one to the apple growers of this country. The resolution was passed and it is possible that in the near future something may be done in this line.

The question that I was requested to speak upon to-day more particularly is that of fruit statistics. I think that the conference has already had some beneficial results inasmuch as according to the programme, the Deputy Minister of Agriculture has been induced to give us an address on the subject, and I am bound to say that I believe when Mr. James takes hold of the question something will result from it. I need not say that statistics in regard to the fruit industry of the Province and of the Dominion is an important question. Some years ago I did a certain amount of Institute work, and time and again I was asked by fruit men in various parts of the Province what was the value of the fruit industry, what was the average annual value of the apple crop in the Province, and questions like that. I had no data; I could not answer the questions. When Mr. McNeill asked me previous to the last conference to go into the question, I tried to do something with it. I sent for the Census Report for 1901 and the Dominion Trade Reports, and delved into those figures for a month or so and tried to evolve something that might be useful to the conference. I found that in the 1901 Census Report:

- (1) The values of the fruit and vegetable crops are lumped at \$12,994,900.
- (2) That in connection with the number of trees, there are separate columns for apple, pear, plum, peach, cherries and for "other tree fruits," bearing and not bearing by counties, provinces and Dominion.
- (3) In connection with the crop yield there are separate columns for each of the above classes by provinces, counties and Dominion.
- (4) That in regard to acreage, all orchards are lumped together. The acreage in vegetables and small fruits is lumped; vineyards are given separately.

The statistics at present collected by the Province of Ontario give the following information:—

- (1) Acreage of orchard and garden by counties and province;
- (2) Acreage of vineyard by counties and province;
- (3) Number of apple trees, fifteen years old and over, and the number under fifteen years by counties and province;
- (4) Also, total crop in bushels, and average number of bushels per tree, by counties and province.

I would recommend that the Department be asked to give further details as follows:—

Acres of apple orchard. County and Province.

" pear	"	"	"
" plum	"	"	"
" peach	"	"	"
" cherry	"	"	"
" other tree fruits	"	"	"
" small fruits	"	"	"
" vineyard	"	"	"
" garden truck	"	"	"

To continue giving the number of apple trees by counties and province and also the average yield per tree.

Mr. Peart then moved the following resolution, which was seconded by Mr. Harold Jones and carried:

That the Government of Ontario be asked to publish yearly in the Report of the Bureau of Industries further details of the fruit industry of the Province.

## ADDRESS.

By J. A. RUDDICK, DAIRY COMMISSIONER, OTTAWA.

I have been very much interested in the discussion that has taken place here this morning on the election of directors, and I observe that this Association has to contend with the same difficulties in this connection as other similar associations meet with in other parts of the Dominion. It appears to me that it would be a good thing, both for this and other associations, if some plan could be devised for the conduct of the elections so that the time of the delegates who come so far to attend these meetings might not be occupied so long with the matter. Still I think it is a good thing that you should take an interest in this question and that there should be an intelligent selection made.

I am glad that the question of the standard size of baskets has come up in the form of a resolution. I hope that the influence of this Association,



supported by that of the basket manufacturers, may result in the desired amendment to the "Act Respecting the Packing and Sale of Certain Staple Commodities."

I am glad to observe that the co-operative movement is making some progress in Ontario in connection with the shipping and packing of apples, and other fruit. I am a strong believer in the principle. Canadians as a rule are not very favorably inclined towards co-operation. Some people say we are too independent and want to act individually. The most truly independent people I know of have made the most progress in co-operation. I refer to the Danes. Co-operation makes for true independence. I should like to ask the representatives of the Co-operative Fruit Growers' Associations whether they do not feel that they have more power and that they are in a more independent position in many ways than when they were acting individually. The spirit of co-operation is abroad, and I would only add that as far as the Department at Ottawa with which I have to do, is concerned, we are only too glad to lend our assistance and support in any way in which we are competent to give it. The extent to which people co-operate is a very good indication of the amount of progress they have made from a state of savagery. It is among savage races that we find individualism carried to the extreme. As we progress in the scale of civilization, our needs for co-operation increase. I am sure that anyone who visits Denmark and examines even casually the methods and results obtained there, cannot fail to be impressed with the importance of the question. They are the most successful agriculturists in the world to-day, and their work is done almost entirely under some form of co-operation. The Danish farmer is the best educated farmer in the world—educated in that which will help him along in his own line of work. He may not have a better literary education than many others, but he has been educated along the line of agricultural effort to such an extent that he is able to sink his individuality for the sake of the general good; that is why co-operation has been such a success in Denmark. They are loyal to their institutions; they stick to them through thick and thin because they are able to see beyond a momentary gain to the ultimate result of any particular course of action. They will not be weaned from their own institutions even though they are offered higher prices from outsiders, and this is why they have made the movement such a success.

I think there is great room in this country for the development of cold storage in connection with the handling of our fruit products. I have no very definite idea at present as to how this ought to be worked out, but I see some movements in progress that are calculated to render very great assistance to the industry. In New York State they have had great success in this direction and by this means they are able to preserve their fruit in good condition and thus avoid temporary gluts in the market.

I have been giving some attention to the question of transportation. The Middle Canadian West, which is rapidly filling up, will, in the near future, require an enormous supply of fruit. In that country where everyone must buy his fruit, the demand will be very great. It will mean a tremendous amount of traffic in handling tender fruits, and in those that can be transported more easily. I have been giving some attention to the shipments made by the St. Catharines Cold Storage Association during the past season, and may say that they have been very successful indeed, even as far west as Calgary. I am pleased to be able to state also that some successful shipments of tender fruits have been made to the Old Country this year. Transportation facilities on the ocean have been very much improved and so have the facilities for handling all kinds of perishable products on the other side. They are just waking up in Great Britain to the importance

of cold storage establishments. The success of the cold storage plant at the Surrey commercial docks is influencing the authorities at other points to take similar action, and it will not be long before you will find cold storage right on the quays at all the leading ports. These things are of great importance to fruit growers, and I believe there is a very much better chance to-day than ever before for successfully placing tender varieties of fruit on the Old Country market. Not long ago I interviewed some of the Covent Garden people and they spoke very highly of some of the peaches sent from this country. These were shipments that had received the benefit of the cold storage system I referred to.

The future seems to be full of promise for the fruit grower in the Province of Ontario. You may have difficulties to contend with, but you are beginning to handle these things in a better manner than formerly. It seems to me that what the fruit business of this country needs more than anything else is organization. Cold storage will not remove all the difficulties nor prevent all the waste that is going on: A good many people who have not thought much about it go round the country and see the vast quantities of apples lying on the ground, and come to the conclusion that if we only had cold storage the whole of this waste would be avoided; something more is required. Proper organization is necessary. Many farmers have orchards, but the orchard is only a side line. If he has a crop, he is so much ahead, but if it is a failure, he has not been depending on it. The majority of our farmers who are growing apples are not orchardists. What we need is more farmers who are orchardists, giving more special attention to their orchards so that the apple raising business may cease to be a mere side line.

## FRUIT STATISTICS.

BY C. C. JAMES, DEPUTY MINISTER OF AGRICULTURE, TORONTO.

Mr. Peart has called your attention to the resolution adopted at the Ottawa Fruit Conference in reference to the collection of fruit statistics, and I suppose that this resolution was intended to be the basis of anything I might have to say to you this afternoon. This is one of those questions which it is so easy to ask and so difficult to answer. One might almost say there are no fruit statistics; and anyone who undertakes the task of trying to collect them will find that he has undertaken one of the most difficult statistical propositions to which he could set himself so far as this Province is concerned. Back in 1892, when perhaps we were not so wise as we are now and dared to attempt greater things than at present, we thought we would undertake the work of collecting and tabulating fruit statistics. Some of you will probably remember that at the meeting held, I think, at Hamilton, I presented certain statistics as to the extent of orchards, the number of trees, etc. It was thought by some that these figures were grossly exaggerated, but the more they were looked into, the clearer it became that, instead of over-estimating, we had under-estimated the extent of the industry so far as the number of trees was concerned. I found later that the figures we then put out did not disagree to any great extent with the figures lately put out by the Dominion Census of 1901. For instance, in 1892 the number of bearing apple trees was stated to be 6,637,000, while the census gives the number at 7,081,000. We have found that the Dominion Census, which is a compilation got from the individual



growers, corresponds in the case of apples, pears, plums, peaches, cherries and grapes, fairly well with our figures, which are merely estimates. Our estimate, for instance, of the number of grape vines is 2,174,000, while the census places the number at 2,043,000.

We thought that having for several years estimated the number of trees and vines, it would be a comparatively easy matter to figure out the crops. We have been fairly successful in figuring out grain crops, etc., and thought it would be but a small step to extend the work to fruit. We soon discovered our mistake, however. To illustrate: Here is a man with a ten acre field of wheat. Most of you here on looking at that field would be able to make a fairly accurate estimate as to the number of bushels it would yield, and it would be the same with all other grain crops. After the wheat has been harvested, and the threshing done, and the granaries have been filled, you have a means of verifying your calculations. Everything that was grown in the wheat field is stored in the bins, and there is very little trouble in calculating with fair exactness how much wheat, oats, barley, etc., your farm has produced. If this can be done on one farm, it is simply a question of enlarging your field and you can figure out the crop production for the whole Province. On the other hand, we have here to deal with an apple orchard, and I think you will agree how difficult most of you who are not experts in that line would find it to go into that orchard towards the end of the season and estimate, within a reasonable limit, the size of the crop the orchard will produce. This is one of the reasons why the buying of fruit on the trees is condemned in so many districts, that is to say, it is for the most part very uncertain whether the producer or the buyer is going to make money on the transaction. When, therefore, we have asked farmers to give us their estimates of the fruit crops, we have frequently hesitated about publishing them. Even after we have secured an estimate of the crop on the trees, it is by no means sure how much of that will be harvested. In certain sections—not the special apple growing districts—there are immense quantities of apples which are estimated but which are never taken into the barn or fruit-house, but are allowed to fall and be consumed by the hogs or rot on the ground. For this and other reasons when we take up this question we find ourselves confronted with a serious difficulty. Another point is that fruit crops are not as evenly distributed as are the grain crop and live stock of the Province. You may think that you are setting us a very simple task when you ask us to compile these statistics, but we have found so many difficulties in the way that we hesitated about undertaking it unless we felt sure that it could be done satisfactorily. The necessity and importance of having these statistics we all fully recognize. The question is, can anything be done in this direction, or must the fruit growers depend upon the census figures which are taken every ten years. Perhaps you may say that if they can be taken every ten years at the time of the census, why cannot the Provincial Department do it every year? Some of you may have watched the discussion in the papers as to the cost of taking the last census. If so, you will understand why the Department or the Government of this Province hesitates in a matter of this kind. The cost of taking an annual census where every producer is visited would entirely preclude such a task.

Q.—Would it not be possible to use the county officials, giving them more columns to fill out in the annual assessment?

Mr. JAMES: If you had been up against township councils and assessors for twenty years, as I have, you would know that it is almost a hopeless task. Unless you are prepared to pay them for the work, I do not see

how we could ask the assessors to obtain any further figures. Another great difficulty is this, that while we have a number of very competent assessors, there are some others who are not very competent. We are having the greatest difficulty in getting our municipal statistics, which are comparatively simple. If the assessor had to obtain, in addition to what he now procures, an exact statement of the fruit products of the previous year, I do not think we should obtain reports that would be at all satisfactory or complete.

Mr. ARMSTRONG: I am of opinion that if the assessor in every township was given to understand that he would receive say \$3, which would be a small sum in the aggregate, for this work, it could be done.

Mr. JAMES: I do not think so; \$3 would not begin to pay him for his services.

Mr. W. L. SMITH: It would be a simple thing for him to give the number of trees.

Mr. JAMES: We have that in the census. The question is to find out at the time the fruit man wants to know it, what there is on these trees in the shape of a crop, and also at the end of the season what has been harvested. The assessor could not very well do that. What he would get in the spring when he went his rounds, would be the production of the year previous.

Mr. ARMSTRONG: The object of the resolution is not so much a commercial one as to give the public a fair and honest statement of the extent of the fruit industry in the Province.

Mr. JAMES: I want to give you another point for consideration. I have spent much time thinking over this to see whether it would not be possible to arrive at some satisfactory figures. According to our estimates we have figured that last year there were 7,000,000 bearing apple trees in the Province, and that they produced 31,000,000 bushels. These estimates are made from the farmers' own reports. In the *Mail and Empire* of Tuesday last, you may have noticed an item under the heading of "A Heavy Apple Crop," which stated that one firm in this city estimated that the total crop would approximate 500,000 barrels, which is about 25 per cent. less than a year ago. When you run up against the fact that the actual crop marketed, as given by the wholesale fruit men, is only from 500,000 to 750,000 barrels, and you find from the farmers' statements that the trees carried from fifteen to twenty-five million bushels, you feel completely at sea about it. You come to the conclusion that if there is anything at all reliable in these figures, then the apple orchards of this Province are the most neglected and the least productive parts of our farms. If we have seven million trees producing apples, and this year there are only 500,000 barrels that are marketable, and that last year only 25 per cent. more were marketed, then the waste must be something appalling, and our apple orchards must be one of our great neglected assets.

Q.—Is the difference not due to the San Jose Scale in the southern part of Ontario?

Mr. JAMES: Damage by San Jose scale cuts a comparatively small figure so far as seven million apple trees distributed over the Province are concerned.

Mr. MACOUN: Have you ever considered the advisability of getting the school children to collect the information for the teacher? They might be given blanks to take to their homes and fill out, and the teacher could forward them to the Department.

Mr. JAMES: We have not become acquainted with any workable scheme yet except the plan we have been trying to introduce during the past two or three years. We have concluded that the only way to get the informa-



tion is to send out for it. We know very little about the special crops of the Province, and during last year and this we have been gathering some information on the subject. As a result we have several reports which we intend to publish before long. For instance, a man specially qualified has, during the past summer, been gathering information in regard to the bean crop. He has obtained information that could not have been secured by circular or by any such means. Then we have two or three other reports. We sent a man to one of the townships of East Northumberland to collect information regarding apple growing in that section. Another man has secured information in the canning sections. We have thought that if we could get a resident in each section to take charge of that section and study the crops there, reporting to us on the whole of the crops of the district from his personal observations, we should in this way get the information we require.

If any of you have any suggestions that are workable, we shall be only too glad to receive them, but you will probably find as you think over the matter and the suggestions made, that there are more or less difficulties and objections in the way. Take for instance the suggestion that the school children should do the work. This I fear would be an uncertain method, and would depend largely on the attitude of the teacher. One teacher might look after it all right, and the teacher in the next section would say "There is nothing to be gained by this; I am not paid for it at any rate, and I do not think I will do it." Then take the suggestion to pay the assessor an extra \$3.00 for this work. The assessor goes to every farm house; he has to ascertain the number of apple, pear, peach and other trees, and fill in the amount of the crop produced; the farmer's wife is not in a position to give him the information and has to refer him to her husband, who is away perhaps at a distant part of the farm. When he comes, as likely as not, he cannot give the exact number of fruit trees he possesses, much less the amount of fruit they yielded during the previous season. It does not seem therefore that \$3.00 would be an adequate compensation for the trouble the assessor would be put to in the matter. Then as to the suggestion regarding school teachers, I assume that \$5.00 or \$10.00 would not be too much to pay them for their trouble, but there are over 5,000 rural schools in the Province, which would mean a total expenditure of \$25,000 to \$50,000, which, I am afraid, would be altogether beyond our means.

You may be sure, however, that we are working as best we can, and if we can develop any satisfactory system, we shall be only too pleased to do so. But unless we can assure ourselves that these figures are fairly reliable, we think it far better in the interest of the fruit growers not to publish them at all. We feel that our figures in regard to crops and live stock are accurate, and we are prepared to stand by them, as we can prove them to be correct. But when it comes to fruit we have felt that we had no figures that were really reliable. I am not sure, indeed, whether it would not be advisable for us to withdraw even the apple statistics, as the figures given by the farmers themselves give us so little information as to marketable fruit.

Q.—How do you account for the difference between the farmers' and dealers' estimate of the crop?

Mr. JAMES: In obtaining our information, we send cards directly to the farmers on which certain questions are asked. We send out from 25,000 to 50,000 cards. Say that in a given section there are 150 farmers and from 50 to 75 return to the department the cards with the answers filled in. When they reach us, they are checked over and if any palpable mistakes appear, these are thrown out. From what remains, we estimate the total apple crop:

Mr. A. H. PETTIT: Could not four practical men in each county in the Province give us a comparatively accurate report after the fruit is well set upon the trees. Reports are sent throughout the country as to the prospects of the apple crop for the year, and in many cases these are inaccurate. A man sells his orchard on the strength of the report, and perhaps does so at a loss on this account. What we should like to have is, first, a report in advance of the crop, and second, a report of the total crop after it has been gathered.

Mr. JAMES: That is to say you desire an estimate of the crop before the prices are fixed in the market.

Mr. PETTIT: If it is to benefit the fruit growers.

Mr. JAMES: If instead of depending on the individual farmer to make reports, we could afford to keep permanently employed in the different sections, men who would make it their business to collect these reports for us, I think we could get good information, but it would be an expensive method. Supposing we had a correct estimate early in the season, what would be likely to be accomplished by it?

Mr. RICKARD: I do not think it would be of very much aid to a man in selling his fruit unless we knew something about other countries also, and the world's supply and demand, as these are factors which enter largely into the question of prices. It makes very little difference how many apples you have in Ontario as to what the price will be. It is such a far reaching question that unless you can present all the statistics on the subject, you have very little to go by.

Mr. W. L. SMITH: You could get the reports to which Mr. Rickard refers from the American Consular Reports and through the commercial agents in Great Britain.

Mr. JAMES: One hesitates sometimes about accepting some of them unless we know that their source of information is considerably better than the one upon which we are forced to depend.

Mr. SMITH: I have watched these reports rather carefully for the last four or five years and as a rule have found them to be fairly accurate.

Mr. JONES: I think that if two or more men in each district could make an estimate of the fruit in the orchards, it would give you something of value.

Mr. CASTON: I do not think you will get any better system than the one employed already. There are practically only two railway systems shipping apples in this country. From them we might get a statement of the shipments to the Northwest and abroad, so far as apples are concerned. But there is no single product of the farm that is so largely consumed locally as the apple crop. We have six incorporated towns for example in the county of Simcoe. These people consume a large quantity of apples, and they are supplied by the farmers direct. The shippers' estimate to which Mr. James refers of course takes no account whatever of the fruit required to supply this demand all over the province, and this I think goes a long way to explaining the apparent discrepancy.

Mr. BUNTING: I think we appreciate the difficulties under which the Department is laboring, and their desire to procure the information required. It seems to me that the first thing is to get accurate information as to the number of trees of the different varieties of fruit in each county. That could be provided by the method suggested, that is to say, through the assessor's list, if the question of compensation could be arranged. As to the obtaining of the aggregate output during the fruit season, that could be provided for by appointing two or three men in each county to estimate the crop. I should like to call the attention of the meeting to the fact that



we have here a gentleman from New York State Experiment Station, and that they have instituted an apple survey whereby they arrive at an estimate of the crop.

Prof. PARROTT: In New York State, Cornell University instituted a survey in three of the leading apple sections, but in no case have they made an endeavor to get all the data necessary for the entire county. They simply take different districts that are representative of the county. This work has been done entirely from the standpoint of getting the actual number of trees and the amount of the crop produced, the idea being to determine what varieties have proven most remunerative, what pests are most destructive, and also the relative profit from apple trees grown in sod and otherwise. In Walters township, Wayne County, they have actually visited every orchard and obtained the number of trees in each, including apples, pears, cherries, plums and quinces. They have also endeavored to get the ages of the trees, the number of varieties, and the value of the fruit yields for the last five years. I have some doubt as to the value of the data thus given as to crop yields, as at best it is only an approximation. Take the case of our San Jose scale work, in connection with which we leased eight of our experimental orchards. We found it almost impossible to get the fruit yields for two or three years back.

We are undertaking to make another survey in which we are soliciting the co-operation of the orchardists in Ontario County, the one in which the experimental station is located. This fall we formed our organization, and I think it is going to be one of the banner apple associations in the State. An exceedingly large percentage of the growers attended the first meeting. From the members of the organization we are going to try to get the data we want. Each man will visit the orchards in his community of those who are not members of the association, and will fill out blanks as to the number of trees, the varieties of fruit, ages, pests and crop yields.

I think the value of the reports to the state regarding yields, does not amount to much so far as the marketing of fruit is concerned, unless there is very close co-operation with all the other States of the Union. It does not help the apple growers of New York to know what their fruit crop is, unless they know what has been produced in the other States as well. Before the reports have any great value in aiding the marketing of the crop, it is necessary that there should be close co-operation with other states. During the past summer it was reported in New York State that there was only 60 per cent. of a crop. Farmers were advised to hang on to their fruit, and reports were spread that in other states the crop was small. As a matter of fact I have information that in Missouri, Iowa, Illinois, and some other states in the central district, the crop is an unusually large one.

Mr. RICKARD: I think that the most effectual way of getting at the number of trees would be through the assessors or through the local municipal government. If you have an apple-growing municipality like the township of Clark or Darlington, or any of the fruit townships of Northumberland, it is worth something to the people to know these things, and if the local municipal government takes the proper view of it, they will be willing to aid the assessor to secure the information. If it is a municipality where there is very little fruit grown, there would be very little work to do and it is not so important.

Mr. PEART: I should like to see this resolution or a similar resolution passed by the meeting so as to draw the attention of the Government to the matter. We are making no recommendation as to the method of procedure, but simply asking for further fruit statistics in detail.

Mr. JAMES: If the assessment roll is to be enlarged by the addition of these columns, it can be done only by special legislation. It should, I suppose, receive its initiation through a representative body of fruit growers such as this.

Q.—What procedure would you suggest?

Mr. JAMES: One way would be to ask the Government at the next revision of the Assessment Act to provide columns in the assessment rolls for the collection of such data regarding fruit trees as may seem desirable.

The Chairman then put the resolution to the meeting and declared the same carried.

On the resolution of Mr. PEART, seconded by Mr. MURRAY PETTIT, the following were appointed to deal with the matter: Messrs. W. H. Bunting, Murray Pettit, and A. W. Peart.

### REVISION OF THE CONSTITUTION.

The Secretary presented the following report from the Committee on Revision of the Constitution:—

Your Committee beg to report as follows:—

Clause 1.—Add after the word "Ontario" the following: "And hereafter in this Constitution shall be referred to as the Ontario Association."

Clause 4.—Insert the word "Financial" after the word "Association."

Clause 12.—After the sentence ending in the words "Annual Report," add the following: "He shall call the first meeting each year of the new Board of Directors within six weeks after the end of December."

Clauses 7, 8, 24, 25, 26, 27 and 28 shall be cancelled and the following substituted:—

7.—The election of directors shall take place in December of each year at Board meetings of the affiliated associations, as defined in Clause 28 governing affiliated associations.

8.—The newly elected directors shall, at the first meeting of the Board, appoint from among their number, a President and a Vice-President, and from among themselves or otherwise a Secretary-Treasurer.

24.—Fruit growers in any section of Ontario may form a local association, which, later, may become affiliated with the Ontario Association on the condition defined in Clause 26.

25.—It shall be the duty of the officers and directors of the Ontario Association to encourage the formation of such local associations.

26.—Any local association may affiliate with the Ontario Association when it has a membership of ten, upon the payment to the Treasurer of the Ontario Association of \$5 for the first 25 members or fraction thereof above nine, and 25 cents per member for every additional member, which payment shall entitle the members to all the privileges and advantages of membership in the Ontario Association, including representation on the Board of Directors upon the terms defined in Clause 28.

27.—Fruit growers, who are members of two or more local associations shall be accepted as members of the Ontario Association from that branch association only which is the first to forward their membership fee to the Secretary-Treasurer of the Ontario Association.

28.—The directors of each affiliated association shall, during December of each year, appoint a director of the Ontario Association as follows:—



(a) Any association having ten members or over shall appoint one director, whose expenses when attending meetings of the Board shall be paid by the Ontario Association.

(b) At all Board meetings of the Ontario Association each director present representing any branch shall have the right to cast one vote for every twenty-five members or fraction thereof of his branch who are members also of the Ontario Association.

The proposed amendments were then taken up for discussion clause by clause. Section 1 having been passed, the clauses relating to representation on the Directorate of the Association were discussed. A number of views were given expression to in this connection.

Mr. W. L. SMITH was of the opinion that a local fruit growers' association should be organized in each electoral district. These associations should each send a delegate to the convention. These delegates would form the Provincial association, and they should, from among themselves, elect a board of directors.

Mr. CASTON contended that district representation must be preserved, and that where there was no local association the horticultural or agricultural society for the county should nominate a representative.

Mr. LICK stated that the one thing certain was that the directors must be elected by members of the Ontario Association and not by members of agricultural societies. He would give each paid-up member of the district associations one vote for a director for that district, and the name of the person elected should be forwarded to the secretary of the Provincial Association.

Mr. ROBERTSON, of St. Catharines, recommended that representation should be proportionate to the membership of the local associations, as the importance of the industry in any given district should be taken into account.

Mr. SMITH moved the following resolution: "That the Ontario Fruit Growers' Association shall consist of delegates elected by the local association, one such association to be formed for each Electoral District in the Province, and that these delegates shall elect in convention the officers and directors." Mr. ROBERTSON seconded the resolution.

Mr. W. E. WELLINGTON stated that a special committee should be appointed to deal with the matter. In his opinion the districts should be allowed to remain as at present; that each district should have at least one representative, and the number should be increased where the importance of the industry warranted it. This would give a representative meeting, and from among those present the directors should be elected by ballot.

Mr. LICK stated that most of the objection to the old method was on account of the directors having their travelling and other expenses paid while at the convention, which gave them an undue advantage.

Mr. BUNTING thought it desirable to do away with the practice of paying directors' expenses, although it might work some hardship in the case of those who had to come a great distance. He would suggest paying their expenses to business meetings, but not to the annual convention. In order to get a more representative board he suggested that each association elect its representative by ballot.

Mr. R. B. WHYTE, Ottawa, stated that in his district it would be practically impossible to form an organization, and that therefore it would be left without representation. He agreed with Mr. Wellington that the matter should be dealt with by committee. He therefore moved in amendment that the matter be referred to a committee consisting of the following: E.

Lick, H. Jones, W. L. Smith, G. A. Robertson, W. H. Bunting, D. Johnston, E. Morris, P. W. Hodgetts, and that the committee report to the convention at the earliest possible moment.

Mr. Smith, having withdrawn his resolution, the amendment became the original motion, and was put to the meeting and carried, and later the chairman of the committee, Mr. Lick, reported that all were agreed on the following principles: first, to leave the districts as they were at present; second, that each affiliated association having ten members should be admitted to membership in the Association; that the fee should be five dollars up to twenty-five members, and twenty-five cents for each additional member; that each affiliated association should send one delegate, and that for every twenty-five members after the first twenty-five, they should be entitled to an additional delegate, whose railway expenses to the annual meetings should be paid by the association.

Mr. LICK moved the adoption of the report and was seconded by Mr. MURRAY PETTIT.

Mr. THOMPSON moved in amendment, seconded by Mr. ARMSTRONG: That the Constitution be so amended as to provide that no director should hold his position for more than three years consecutively.

In the discussion that followed it was pointed out that this would result in the immediate loss of all the old directors, and the opinion of the meeting appeared to be that it was in the best interests of the association that changes in the directorate should be made gradually and with discretion.

Mr. WHYTE moved in amendment to the amendment, seconded by Mr. ARMSTRONG, that the four oldest directors be dropped off each year, and that four new men be elected to take their places, but that those dropping out should be eligible for re-election after the lapse of one year. Mr. Thompson having withdrawn his amendment, the chairman then put Mr. Whyte's amendment to the meeting, and the same was declared carried.

Mr. BUNTING moved, seconded by Mr. JONES, that the report as amended be adopted.

Mr. CASTON stated that he was strongly of the opinion that the local associations should nominate and elect their own directors for the reason that those nominated were often unknown to the general meeting, and could not be voted upon intelligently.

Mr. THOMPSON also endorsed this view.

Mr. LICK moved in amendment, seconded by Mr. WHYTE, that the report be laid upon the table until after the election of directors had taken place.

The Chairman, having put the amendment, declared the same lost.

The motion to adopt the report as amended was declared carried.

The amended Constitution will be found at the end of the Report as "Appendix B."

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## ADDRESS.

By HON. NELSON MONTEITH, MINISTER OF AGRICULTURE, TORONTO.

I am sure that it is with much pleasure that I have listened to the discussion in reference to peach growing. Much as that industry represents in this Province, we have still greater interests in the fruit line. These are days of changing conditions among us. Population is flocking to our large centres, the ever-increasing needs of the community are becoming more



apparent from day to day, and I believe that the fruit growing industry is something that bids fair to profit from this condition of things, more, possibly, than some other lines. I am glad that the fruit growers come together here from year to year to consult as to the best methods whereby this great industry may be fostered.

One thing has struck me very forcibly, and that is the apparent decadence of the apple industry, at least in some sections of our Province, and the lack of attention which is so noticeable in many of our orchards. This may not have impressed some of you so much as it has impressed me, because the majority of you come from districts where fruit growing has become a leading industry, and not merely one of the side lines of agriculture. There is, however, a great district in the western portion of the Province, and to the north of that, where the industry has apparently lost its influence upon the grower, and I believe that this Association should try to do a little missionary work in these sections. We should either get rid of these orchards or else put them into proper shape in order that they may be made productive and a source of revenue. Not only so, but I think the importance of combating the various diseases and insect pests to which fruit growing is heir should be impressed more and more upon the grower. Those of you who are represented here are looked upon as the cream of the fruit growers of the Province. You have been successful in the business, and you come here from year to year to profit by each other's experience; but the fact remains that the great mass of the people are untouched by this Association.

What has impressed me, and no doubt has impressed a great many of you also, is the opportunity fruit growing presents for making farm life more attractive. As I stated at the outset, conditions are changing. The flocking of the people to the cities, and the filling up of the west, is telling heavily upon our rural districts. What is wanted is something to make country life more attractive to our boys and girls, and thus maintain the even balance that is so necessary for our political and social well-being. It appears to me that the varied lines of fruit growing present some of the most attractive features known to rural life, and I think you have a great mission to perform in keeping these ever before the public mind. Our agricultural publications are doing much to popularize fruit growing, but much still remains to be done.

We are glad to have with us Prof. Parrott and Mr. Hale from the neighboring republic to discuss with us some of the methods adopted in that progressive land. Ontario is one of our banner provinces in the line of fruit production. It has a large territory to supply, but through our recent methods of co-operation in packing, the grading of our fruit, and the advanced legislation dealing with the matter, we believe that we shall be able to maintain our reputation both in the home and foreign market.

I would leave one thought with you, a thought that is possibly well-known to you, and that is that there never has been a time in the history of this country when quality counted as much as it does to-day in every line of production. We are having times of prosperity, and the people are willing to pay for a good article. To supply it should be the ideal of the producer in all lines of agriculture.

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## LOW-HEADED PEACH ORCHARDS.

BY CHAS. F. HALE, SHELBY, MICHIGAN.

While I have had experience with low-headed peach trees, and am prepared to advocate them, I do not know that I ever saw the topic presented to an audience before, and I hardly know what I am expected to say on the subject, nor do I know what you consider here to be a low-headed peach tree. We have in our section trees that are headed all the way from 6 inches to 5 feet. The man with the latter thinks they are low enough; while he who has them headed at 6 inches says they are none too low. I have had about eighteen years' experience in growing peaches, and will give you my own experience. They call me a fruit crank because I love the business and make a specialty of it—not only of peaches, but all kinds of fruit that we can grow—and nothing gives me greater pleasure than to spend my time talking about fruit. What, may I ask, has brought up the discussion of this question? If there is need to discuss it, it evidently shows that some of you have had trouble with high-headed peach trees or the subject would not have been presented.

In planting out an orchard I would head the trees where I want them to start, and this would be at about 18 inches from the ground. If I deviated from this, I would head them still lower. A few years ago we considered that about 2 1-2 feet was the right place to head the trees at the start, but we have found from experience that it costs more to carry these trees to a bearing age, and to spray them and to pick the fruit than it does with those that are headed lower, and expense is the great item for consideration.

In starting trees at that height I would endeavor to head them with not more than four limbs, if possible branching out in different directions, not all from the same point on the tree. I would have the highest branch not more than 18 inches from the ground and the others below. These branches form the start. At the end of the first year, I would practice heading back. I would at no time have the centre of the tree higher than the branches on the outside. It costs more to prune them when you have to send a man up a ladder to do it; the same with spraying the orchard. If you have to have something raised on which to climb to spray the trees, it is more expensive, and besides you cannot do as thorough work, and so in picking. Then, too, your trees are much more likely to break down with snow and storm if they are headed high, owing to the fact that you do not get that short, stocky growth but a spindling, willowy growth. We used to think that an ideal orchard was one headed so high that you could plow and cultivate right up to the tree trunks, but the fruit never did so well. It is natural for the peach tree to grow low. These are the main reasons why I would head a tree low and why I would keep it low. We prefer to have our trees 20 ft. apart and we keep them cut back so that we can reach them and control them. They are stocky trees and stand the winter well.

As to peach culture, I do not know your practice here. We practice thorough cultivation. We do not believe in sod methods. We have run across gentlemen from some States who tried to preach that to us, but we did not take to it kindly. If you want a good thrifty peach orchard or any other orchard, we consider that good thorough cultivation is just as necessary as in the corn field. In starting an orchard our practice is to grow some hoe crop in the orchard for two or three years. We have not found this detrimental, at least for two crops, if the ground is in any kind of condition when the orchard is set out.



Q.—What do you mean by thorough cultivation? How long does it extend through the season?

A.—At least till the first of August.

Q.—Do you put any cover crop on the soil?

A.—Yes. As a general thing we use oats more than anything else. We have tried cow peas and other crops, but at the present time oats give the best results.

Q.—What implements do you use to reach under the low-headed trees?

A.—We use the plow and drag, that is about all. You can so arrange your plow or set it that you can put your team off to one side and plow closer to the tree than you think you can. Another thing, if the trees are low-headed, grass and weeds will not grow as rapidly near them. Then I take a common strong drag and zigzag around the tree with it.

Q.—Give us your method of pruning from first to fifth years.

A.—As a rule I cut back from one-half to two-thirds of the growth each year, beginning with the first year; perhaps more the first year. I have trees that made from three to five feet of growth the first year. I would cut them back to within a foot of the trunk.

Q.—How much thinning or pruning would you do before the trees commence bearing?

A.—The first year I would cut out nearly all the growth.

Q.—At what season?

A.—As early in the spring as possible. I do not know that there is any difference in the season, but, I think, if anything, that when the sap begins to start is the best time; but we cannot get through all our pruning then.

Q.—The third year do you pick the small fruit out in addition to thinning the branches?

A.—Yes. Every season after we get through pruning, we start to thin the fruit, and you would think if you saw us that we were doing our best to spoil the crops. After the tree is bearing we thin the fruit from 6 to 8 inches apart as a rule; at least we give this instruction to our men, and it is a good plan to keep away from the orchard while this work is being done, so that you may not change your mind.

Q.—Do you thin all varieties the same?

A.—There are some varieties that are shy bearers, and it is not necessary to thin them at all, but the heavier bearing trees should be thinned. Elbertas for instance are not apt to need very much thinning, while Golden Drop needs a great deal.

Q.—In the Siberian varieties have you ever tried to counteract the sterility of the blossoms, thus securing a larger crop of fruit?

A.—I do not know of any method that has been successful. They are of very fine quality but we have never found any method by which we could make them productive.

Q.—If you thin your fruit from 6 to 8 inches apart, how many bushels would be considered a good crop?

A.—From 3 to 4 bushels; but from 2 to 2 1-2 is a good average crop.

Q.—What fertilizers do you use?

A.—That is something we disagree on. Some use commercial fertilizers and some use legumes. If we cannot get anything else, commercial fertilizer is mostly used. I do not think any of us could answer the question positively. One year we think we have found it all out, next year, conditions change and we find we know little about it.

Q.—How do you prepare your land for planting?

A.—Just as you would for a corn crop.

Q.—Would you take a piece of sod land?

A.—If I wanted that piece of land I would, but it is not so easy to take care of the first year.

Q.—Give us a list of the varieties that have done best in your section.

A.—I can cut them down to a very few. When I first went into the business I had about 25 varieties. I planted about 5,000 trees during the last two years and they consisted of St. John, Conklin, Engol Mammoth, Elberta, New Prolific and Smock. Golden Drop has been planted very largely for canning purposes, and Kalamazoo and Bronson Seedling. They are very similar and ripen at about the same time. Conklin ripens at about the same time as Crawford. Of Elberta, 50 per cent. of the trees set out in the last three or four years have been of this variety. I class Elberta with the Ben Davis apple and the Keiffer pear. I do not think either of them are worth eating, but they market well.

Q.—How do you treat the borer?

A.—Dig him out. With low-headed trees where the branches grow low to the ground, I find we are not troubled one-tenth as much with borers. This is a point I intended to mention. Borers do not like to work in the shade. We are hardly giving a thought to borers any more. I have a young orchard two years old; I looked the trees over for borers this year and did not find a single one. I have heard many say the same thing.

Q.—How old are these low-headed trees?

A.—I have orchards six years old and no borers, that is none to speak of.

Q.—Not even the pin borer?

A.—No.

Q.—Do you think a man is likely to be bothered with borers unless he plants them?

A.—Yes, I do.

A MEMBER.—Lots of men plant them but they think they do not.

Q.—What would be the average height of the trees in this six year old orchard?

A.—Not over 10 feet.

Q.—What distance apart do you plant?

A.—From 18 to 20 ft.

Q.—Does not the greater distance tend to make them low-headed?

A.—Yes. If they are crowded, they have to go somewhere and they go up.

Q.—At six years old how close do they come together?

A.—They will come right together. The lowest limbs on these trees will start 1 1-2 feet from the ground. We are heading lower now than then. By practising the pruning back system, the lower branches are not so apt to die.

Q.—Have you tried the Oceana Peach?

A.—This peach originated within a few miles of where I live. While I am not raising it, I have seen some very nice specimens. I do not think it is as good as some of the other peaches, but is a very nice late variety.

Q.—Your heading back the lower branches forces new wood up in the body of the trees, does it not?

A.—Yes.

Q.—Are you growing the Dewey?

A.—I planted some, but would not again. They were supposed to be free stones when we got them. They are a very nice peach for an early variety, but at the same time I would rather have a white peach. They sell just as



well. We have a variety called the Davidson which is a very fine white peach and a heavier bearer. They are fairly free and the peaches are nearly as large again as the Dewey.

Q.—What about Engol Mammoth?

A.—It is one of the best.

Q.—Is it a larger peach than the Crawford?

A.—No, about the same size. The old Crawford peach is apt to have several large specimens and a lot of smaller ones. Engol Mammoth is more uniform.

Q.—What is your objection to the Late Crawford?

A.—It is a very shy bearer.

Q.—Have you a light sandy soil?

A.—Yes, a light loamy soil.

Q.—Is the Dewey free from rot?

A.—No.

Q.—I suppose you spray with bluestone in the spring?

A.—I spray everything in the fruit line.

Q.—Do you find that spraying with bluestone stops curl leaf?

A.—Yes, it will do so. With this object you should spray as soon as you can get on the ground. I would not use the Bordeaux, but just the bluestone without any lime, 2 1-2 to 3 lbs. to 50 gals. of water. We give but one spraying for curl leaf. I know many men who spray and then say it does not do any good. But they are not thorough. I have heard the remark made here this afternoon that you could not control the codling moth by spraying. Now, I know that you can. I have seen it done a good many times, so that you will have almost 90 per cent. apples. But if you leave a part of the tree or a branch, I do not care how small it is, the work is not done thoroughly, as it must be if the pest is to be controlled. I remember that twelve years ago, after I had practised spraying for three or four years, I thought I was a pretty good hand at it. One day I heard Prof. Taft say, "Be thorough." In talking with him after the address I said, "There is one question I want to ask you. I want you to beat it into my head so that I will know what the word 'thorough' means. I have heard what you have said about thorough spraying, and I thought I had been doing it, and yet I have not got the results you guarantee we can." He said "I will try and explain what I mean. I had a class of boys at the College and sent them out to do some spraying with lime. I had impressed on them that I wanted a good thorough job done. They reported after a time that they had done it and I went to inspect. It looked all right, but I found on close examination that on one side a small part of one of the branches was not covered. I said, "Boys, if you had covered that you would have done a thorough job."

Q.—Have you the San Jose scale?

A.—Not in our immediate vicinity, but we have it in Michigan.

Q.—You do not have to spray for it then?

A.—Not yet, but we shall come to it.

MR. ROBERTSON: Those who have sprayed with lime and sulphur for scale claim that it is just as effective in curing curl leaf.

Q.—How do you treat the codling moth?

A.—Seasons differ greatly, and climatic conditions are different. One spraying will not do it, two sprayings will not do it; some years it may, others it will not. This year in our vicinity we had a dry season and we had no fungus and no scabby apples, and on that account some of us neglected some of the later sprayings. Up to August first the apples were smooth and nice, then the second brood of the codling moth got in its work; but there

were some orchardists who did their spraying as usual, and they have not more than 10 per cent. of wormy apples.

Q.—When did you give the last application?

A.—From the first to the 10th of August.

Q.—What do you use?

A.—Just Bordeaux mixture with arsenic of some kind in it. We use Paris Green mostly.

Q.—How much Paris Green?

A.—About 1-2 lb. to 50 gals. of Bordeaux mixture.

Q.—Do you grow sweet cherries?

A.—Yes.

Q.—Do you head them low?

A.—Yes.

Q.—Do you think they can be headed low and grow successfully?

A.—I do not know why they should not do so.

Q.—What distance do you put them apart?

A.—16 feet on an average for sweet cherries, and we are heading them as close to the ground as we can.

Q.—Have you had any trouble with the larger branches healing over after pruning?

A.—I never had any trouble.

Q.—Can you control fruit rot by spraying with Bordeaux in a wet season?

A.—I cannot.

Q.—Did you ever hear any one say they could?

A.—Yes, I used to say so. A man may have good results one year, but the next year it will be a failure. A few years ago I would have told you on my word of honor that I could control it. I tell you now that I cannot. On plums it is very troublesome. I never had any rot on them until two years ago; then they just wilted right down. That is an exception of course. I think spraying helps it.

Q.—Have you practised low-heading in other trees?

A.—We are heading all our trees lower than we used to. Apples are being headed about 2 1-2 to 3 ft. from the ground.

Q.—What is the cost of pruning a peach tree until it is six years old?

A.—If it has been pruned every year, it would cost much less than if the pruning had been left until the sixth year. If the orchard is six years old and has been pruned every year and it is a thrifty, healthy orchard, allowing from 12 to 15 trees per man per day, and paying him \$1.50 a day, we can form a very good idea. Some men will prune 30 trees a day, but this is an exception.

Q.—Do you head back your side limbs immediately?

A.—Yes.

Q.—Where do you get your help for thinning?

A.—We cannot get one-half the help we need in Michigan. Not one-half the pruning has been done the last two seasons that would have been done if help could have been had.

Q.—In starting your peach orchards do you advocate cutting off all the side branches and laterals that are on the trees coming from the nursery rows, thus reducing them to a whipstock?

A.—Yes.

MR. ARMSTRONG: I should like to say that this is not my practice. I think I have something better. I agree with you in regard to the height. My practice is to trim everything off to about 12 in. to 24 in., but to leave



4 or 5 of these short limbs that were growing one year in the nursery, heading them back to the bud, for the reason that if you leave four or five of these little arms on the old stock and start your bud from one of these arms, you will have a stronger growth because it is one year older.

A.—I would follow that practice with large trees, No. 1's as we call them, but if you are planting the slender, smaller trees, they have not got as many laterals, anyway, and by cutting them off and allowing the bud to start from the tree, you can get it better where you want it.

Q.—We find that nurserymen have the habit of cutting off these small limbs for the purpose of lengthening the height of the tree.

A.—That is where we have to educate them a little. We should refuse to take these trees.

Q.—At what season of the year do you prefer buying your trees?

A.—If I am dealing with a nurseryman who has a good place in which to winter his stock, I would prefer that he should winter them and let me take them in the spring.

Q.—Does he dig them up or leave them in the nursery row?

A.—Digs them up.

Q.—What aged stock do you use?

A.—One year old stock.

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## THE SAN JOSE SCALE, ITS LIFE HISTORY, SPREAD AND REMEDIES.

PROF. P. J. PARROTT, NEW YORK AGRICULTURAL EXPERIMENT STATION,  
GENEVA, N. Y.

As I was examining your beautiful exhibits of orchids, carnations and chrysanthemums, and your extensive collections of fruits in Massey Hall this morning, it occurred to me what a pity it was that it is necessary at this time to discuss such obnoxious pests as bugs and plant diseases. But as there is good and evil in the world, so there is sound and bad fruit, and a large part of the bad fruit is due to the ravages of insects and fungi. Perfect fruit can hardly be grown to-day unless efforts are made to control these enemies. The insects especially play an important role in human economy; and if you are a reader of current events, you cannot help being impressed with the rapid strides that the study of insects has taken among the biological sciences and its important relation to public health and prosperity.

Within the past few years attention has been directed to the ravages of the boll weevil in the cotton fields of the south, the disease-disseminating mosquitoes on the sea coasts, the threatened invasion of California by the Mexican orange worm, the destructive work of the Gypsy Moth and the Brown Tailed Moth in the parks and woodlands of New England, and the appearance of the San Jose Scale into the principal fruit-growing areas of Canada and the United States. All these are insect problems of national interest and their solution is of vital importance to those communities directly affected by them. There was never a time when so much attention was being directed to the study of destructive insects, and never before has so much money been spent to control them. On the other hand there never was a time when our fruit growers were so well equipped with insecticides

and spraying machinery to hold these pests in check. There is hardly an insect pest but what will yield to scientific treatment. This holds true with the San Jose Scale, which at this time is of so much concern to you.

**ITS HABITS.** Now to fight an insect successfully we should be able to recognize it and should know its life history, and the particular stage in its life when it is most susceptible to treatment. Success in fighting insect pests is often determined by this knowledge. The scales constitute a peculiar group of insects which differ in many ways from the active and highly colored forms usually familiar to the casual observer. They are very inconspicuous because of their small size, dull colors and sedentary habits. This is especially true of the orchard species, for they so closely resemble the bark of the trees that at first glance they appear to be a part of it. Failure to recognize the insect and its work may result in irreparable injuries to an orchard.

First of all then, let us consider the nature of the San Jose Scale and its habits, which are well illustrated by the models at hand. These represent the development of the San Jose Scale, which agrees in many respects with that of other common orchard species. Here we have a representation of the young female scale, or mite, much enlarged, which on being born is a microscopic six-legged animal, yellow in color and exceedingly active. This has, as you may observe, many of the parts that characterize a typical insect, which are one pair of feelers, three pairs of legs, and a sucking bill or proboscis, by means of which it obtains its nourishment. Within a few days after its escape from the mother scale, it settles down upon a suitable place and thrusts its beak through the bark into the sap upon which it subsists. Soon there emerge from pores in its body waxy filaments, which gradually become compacted forming a white coat or the first scale. As the insect grows it sheds its skin, which becomes attached to the scale. This appears as a yellow colored nipple-like prominence in the center of the San Jose Scale or at the smaller end of the scale of the oyster-shell, bark-louse, and the scurfy bark-house. In this first molt the female loses its legs, feelers and eyes, but unfortunately she retains the sucking bill. With increase in the size of the body, there is a corresponding enlargement of the protecting scale by the excretion of a waxy substance to its margin. The mature female appears as a wingless, footless, eyeless, grublike creature, as you can observe, which never moves from the spot where she first attached herself as a mite, and which is concealed from the light by a shield or scale of her own excretion. This grub, much enlarged, is the insect herself and this scurfy, filmy body is her protective covering which is composed of the cast-skins and waxy substance from the insect's body. Hence the name, scale insect. After the approach of the male in pairing time, the female enters upon her period of reproduction, at the end of which she dies. The number of offspring varies with the individual, sometimes running up into the hundreds. As there are several broods during one growing season, one female surviving the winter may be responsible for hundreds or even millions of offspring. The male in his early history closely resembles the female, but forms a scale quite different in shape. After the second molt marked, changes take place in his body, and rudiments of external appendages develop; and later when mature, he appears as a small fly, with a pair of wings, by which approach to the other sex is made possible.

**REMEDIES—SOME PRINCIPLES.** Broadly speaking, insects may be divided into two classes, first, those that have distinct jaws, by which they are able to bite off or gnaw off small portions of leaves, bark or wood of a plant; and second, those with mouthparts shaped to form a bill or sucking beak, which can be thrust into the layers of bark or leaves to the underly-



ing tissues and used to suck up the plant or plant juices. The former are controlled by coating the plant attacked with some poison such as Paris Green or London Purple, or other arsenical sprays, so that some of the poison may be included in the food of the insects, while the latter, because of their peculiar manner of feeding, cannot be killed by poisons, and to be destroyed, must be coated with some substance that will clog or seal up the breathing organs, thus choking it to death. The sprays that accomplish this end are called contact remedies.

The scales are sucking insects, but because of their peculiar habits, and wonderful reproductive powers they are more difficult to control than many insects obtaining food in a similar manner. To successfully control the San Jose scale, requires very careful and thorough spraying, that all individuals may be coated with the spraying mixture. If this is not done, the specimens escaping the treatment will live to produce an enormous number of young to infest the tree again. One of the most discouraging features in fighting this pest arises from this very cause. Often the spraying is so imperfectly done, that the offspring from the surviving are numerous enough in one season to make up for the numbers destroyed. In this event little benefit has been derived, and another treatment must be made to prevent the rapid increase and spread of the scale, and to save the trees. To careless work, rather than the kind of spraying mixture used, may often be assigned the cause of the failures to control the scale. The successful treatment of this pest calls for intelligent and persistent spraying. Learn to recognize the scale, know its life history, and follow closely the instructions for the preparation and application of the standard spraying mixtures. The degree of success that will attend your efforts depends to a large extent upon the use that is made of that knowledge.

**METHODS OF CONTROLLING THE SCALE.** The San Jose scale is rapidly spreading into our leading fruit growing sections of New York. In those communities where it is well established, annual spraying for the scale is practiced by the more progressive fruit growers. The orchardists experienced in this work are fighting the scale efficiently and profitably upon peaches, plums, pears, and apples of moderate size. The spraying mixture which gives the most satisfactory results on scale is the boiled lime-sulphur wash. This is used by the larger number of our fruit growers, although some are using the proprietary miscible oils or mineral oils, either clear or emulsified. The lessons our fruit growers have learned from their own experience and the methods that they have developed in fighting the scale to meet their own individual needs, are soon taken advantage of by fruit growers in other communities, where the appearance of the scale is of more recent origin; so that now there is usually not that unnecessary destruction of the trees while the orchardists is familiarizing himself with the proper methods of fighting this pest, as used to be the case. Our successful orchardists are much alarmed at the spread of the scale and are prepared to protect their trees as soon as any infestation is detected.

There is one phase of the scale problem that is not satisfactory, which is, that the spraying of old apple orchards has not usually been successful. In many localities where the scale has been longest present, there are orchardists complaining that it is impractical to spray old orchards for the scale as it has been impossible for them by known methods of treatment to keep the trees in a sufficient healthy condition to produce clean and profitable crops. Disheartened by the poor results attending their efforts, certain of these fruit growers are now neglecting their trees which are dying, thus eliminating one of the principal sources of income of the farm. To protect the old orchards is the remaining important phase of the scale problem.

**A BUSINESS EXPERIMENT IN AN OLD APPLE ORCHARD.** To ascertain the difficulties encountered in spraying large trees, and to determine if there are practical methods of protecting commercial apple orchards, the Geneva Station is co-operating with a number of fruit growers in the treatment of their orchards, special attention being given to old trees. The details in the experiment at Mr. Dutton's orchard at Youngstown will be of interest to you. This orchard has an extent of twenty acres, consisting of 598 trees of at least forty-five years of age. The varieties represented, and the number of trees to the variety are 380 Baldwins, 135 Greenings, 40 Spitzenburgs, 16 Kings, and some summer kinds. The rows are numbered from east to west. There are twenty-eight rows and there are twenty-three trees to the row.

**HISTORY OF SCALE IN THIS ORCHARD.** The scale was discovered in 1900 on one Greening, and in 1903 it was more or less distributed throughout the orchard. In 1904 the crop of Greenings in rows 2-6 inclusive, were badly spotted, and the bark of the trees was much incrustated. Some trees were so severely injured that many branches and occasional limbs were dying. The Spitzenburgs, rows 7-8, and Baldwins, 9-11, showed conspicuous spotting of the fruit. The remainder of the orchard, with the exception of some trees along a ditch, running irregularly through rows 13-17, was to a large extent clean, only a little fruit having scale blemishes.

**EXPERIMENTS IN ORCHARD.** In 1905, crude petroleum was applied to 207 trees, boiled lime-sulphur wash to 345 trees, and kerosene-limoid to 47 trees. Items of expense for spraying orchards were as follows:

#### COST OF SPRAYING APPLE ORCHARD IN 1905.

##### *Crude Petroleum.*

Twenty barrels of crude oil @ \$4.60 .....	\$92 00
Three men for three days @ \$1.50 .....	13 50
Team for three days @ \$2.00 .....	6 00
Wear on sprayer (2½ per cent. of cost) .....	11 25
<b>Total .....</b>	<b>\$122 75</b>

##### Number of trees sprayed, 207.

Cost of oil per tree .....	44
Cost of labor and team per tree .....	9
Cost of treatment per tree .....	59

##### *Boiled Lime-Sulphur Wash.*

3,750 gallons of sulphur wash:	
1,125 lbs. sulphur @ 2½c. ....	\$30 94
1,500 lbs. lime @ 45c. per cwt. ....	6 75
Fuel .....	3 00
Four men for five days @ \$1.50 .....	30 00
Team for five days @ \$2.00 .....	10 00
Wear on sprayer (2½ per cent. of cost) .....	11 25
<b>Total .....</b>	<b>\$91 94</b>

##### Number of trees sprayed, 345.

Cost of sulphur wash per tree .....	12
Cost of labor for making wash per tree .....	02
Cost of labor per tree .....	10
Total cost of treatment per tree .....	27



*Kerosene-Lime Wash.*

1,000 gallons of kerosene-lime wash, 25 per cent. oil:	
250 gallons of kerosene @ 10c. ....	\$25 00
1,000 lbs. lime @ 50c. per cwt. ....	5 00
Four men for 1½ days @ \$1.50 .....	9 00
Team for 1½ days @ \$2.00 .....	3 00
<b>Total</b> .....	<b>\$42 00</b>
Number of trees sprayed, 69.	
Cost of wash per tree .....	43
Cost of labor for making wash per tree .....	03
Cost of labor per tree .....	14
Total cost of treatment per tree .....	60

## COST OF SPRAYING APPLE ORCHARD IN 1906.

*Boiled Lime-Sulphur Wash.*

10,000 gallons of sulphur wash:	
3,000 lbs. sulphur @ 2½c. ....	\$82 50
4,000 lbs. lime @ 45c. per cwt. ....	18 00
Fuel .....	4 00
Seven men for 9 days @ \$1.50 .....	94 50
Two teams for 9 days @ \$2.00 .....	36 00
Wear on sprayer (5 per cent. on cost) .....	22 50
<b>Total</b> .....	<b>\$257 50</b>
Number of trees sprayed, 586.	
Cost of sulphur wash per tree .....	18
Cost of labor for making wash per tree .....	02
Cost of labor per tree .....	20
Total cost of treatment per tree .....	44

The following table is a general summary of data given, showing number of gallons of each mixture used to spray one tree, and cost of treatment.

*Tabulated General Summary.*

Name of spray	Average per tree			Cost of treatment	
	No. gals.	Cost of spray	Cost of labor*	Total per tree	Average per acre.
Petroleum	5	\$ .44	\$ .09	\$ .59	\$17.70
Boiled lime-sulphur wash....	14	.15	.17	.36	10.80
Kerosene-lime wash	14	.43	.17	.60	18.00

RESULTS OF SPRAYING IN 1905 AND 1906 ON SCALE AND TREE. The applications of crude petroleum in 1905 to rows 2-10 inclusive, as shown by this chart, delayed leafing three weeks, and destroyed the fruit crops. The oil was a most efficient spray on scale, the effects lasting through 1906. The trees receiving this treatment are to-day in much better condition with respect to scale and thriftiness than in 1904. The sulphur wash caused no injuries, and was usually not quite so effective as the applications of the oils. The kerosene-lime mixture severely injured fifteen trees and gave variable results on scale. In 1906, the orchard was sprayed with the boiled lime-sulphur wash, with no apparent injuries to the trees. The general appearance of the trees in early summer was better than in 1904, which was largely due to the greater improvement of the Greenings. On August 11, the orchard seemed in better condition with respect to scale than for several

\* Includes labor in making spray.

years, as very little fruit was spotted. During September and October, the scale was unusually prolific, resulting in more or less spotting of fruit, which in this respect was marketable. The crop of Greenings, rows, 3-6, with exception of two trees, was quite clean. The Spitzenburgs and Baldwins, rows 7-12, were very clean. The worst infested part of the orchard was along the ditch running through rows 14-17, and the northern part of rows 21-25. The scale was well controlled in the eastern half of the orchard, but was more abundant in the western half. The fruit yields in 1904 were 9,000 bushels; in 1905, 2,100 bushels; and in 1906, 3,000 bushels. The fruit this year was much injured by the codling moth, the control of which was not a part of the experiment.

### SUMMARY OF RESULTS.

Sulphur washes are cheap, safe and reliable sprays for the treatment of peaches, plums, pears and apple trees of modern size, and are specially recommended for the treatment of peaches for joint control of scale and leaf curl. Applications must be thorough. Good nozzles and a pump with high pressure to produce a fine spray are essential. Cost of spraying per tree is variable, depending on management, weather conditions, labor, kind and cost of fuel and spraying supplies, and degree of thoroughness of spraying. In spraying trees from five to eight years of age, the cost of treatment will vary from 5c to 13c per tree in commercial orchards. Apples from thirty to fifty years of age will cost from 20c to 50c per tree to obtain reliable results on scale.

Treatment of old apple orchards has not been usually successful, largely due to the lack of thoroughness in spraying. Best results on scale have been obtained by orchardists by careful pruning of trees and by spraying with sulphur washes and crude petroleum on alternate years. By this system of treatment orchardists that were fearful of losing their orchards have this year marketed comparatively clean crops. Average cost of sulphur wash per tree 36c, crude petroleum 59c. Crude petroleum is the most efficient spray on scale but may injure trees. It is believed that for results of work that applications of sulphur wash or crude oil emulsion, twenty-five per cent. oil, would prove equally effective on scale without risks of applicable injuries to trees. Commercial insecticides, in all but two of experimental orchards were much less effective than the sulphur wash.

### CRUDE PETROLEUM.

For spraying purposes a grade testing about forty-three degrees Beaume should be used. This is a most efficient spray on scale, but dangerous if used in excess on trees. *Apply clear petroleum on old apples only on a sunny day as buds swell and stop spraying when oil commences to run on bark.* Only nozzles with fine apertures should be used. *Resort to oil treatment for apples is only advised after failure to control scale by sulphur wash.*

### HOME-MADE OIL EMULSIONS.

*Kerosene Emulsion.*—Dissolve one-half pound of soap in one gallon of boiling water. Remove vessel from near the fire and add two gallons of kerosene. Emulsify the whole by pumping it continuously through a small force pump until a creamy mass is formed, from which the oil does not separate. This is the stock material. For mixture containing ten per cent.



oil, dilute whole of stock material with seventeen gallons of water, and for a mixture containing twenty-five per cent. oil, dilute stock material with five gallons of water.

Then ten per cent. oil mixture may be used as a summer spray to check breeding of the scale. If this strength can be used safely on the foliage, increase the percentage of oil gradually in remaining preparations until a twenty-five per cent. oil mixture is reached, if no injuries to foliage in the meantime follow. A twenty-five per cent. oil emulsion will kill both young and old scales, and may be safely used for the treatment of trees in early spring as buds are swelling.

*Crude Petroleum Emulsion.*—Dissolve one-half pound of soap in one gallon of boiling water, and stir in one-quarter pint of liquid crude carbolic acid (100 per cent. straw color). Remove vessel from near the fire and add two gallons of crude petroleum. This should be emulsified after the manner of making kerosene emulsion.

For a mixture containing twenty-five per cent. crude petroleum, add five gallons of water to the stock material. This is advised for the treatment of trees in the spring as buds are swelling.

#### PROPRIETARY OIL EMULSIONS.

A number of these proprietary emulsions, known as Scalecide, Kil-O-Scale, etc., are now on the market. These are handy preparations for treatment of a few trees and when conveniences for preparing home-made remedies are wanting. To obtain satisfactory results, two applications should be made, using from seven per cent. to ten per cent. of the stock emulsion.

#### SULPHUR WASHES.

*The boiled lime-sulphur wash:—*

Lump lime .....	20 lbs.
Sulphur .....	15 lbs.
Water .....	50 gal.

Slake the lime with hot water and make a thin whitewash. Stir in the sulphur and boil mixture one hour. Dilute mixture with water to make required amount of wash. Flowers of sulphur, and light and heavy sulphur flour may be used. *This is the best spray for the average orchardist and is especially recommended for the treatment of peaches. Should be applied to dormant trees in spring.*

*The self-boiled lime-sulphur wash.*

Lump lime .....	30 lbs.
Sulphur .....	15 lbs.
Caustic soda .....	4 to 6 lbs.
Water .....	50 gal.

Place lime in receptacle and start it to slake with water, hot preferable, using enough to make a rather thin paste. As soon as boiling action commences, add the sulphur, which has just previously been made into a paste with water. After the slaking of the lime, add the full amount of caustic soda and stir till the soda is dissolved. Dilute the mixture with water to make the required amount of wash. The soda used in this wash is a powdered seventy-four per cent. caustic soda, made in Philadelphia, Pa. This mixture is advised when conveniences are wanting for the preparation of the boiled sulphur wash.

*The self-boiled salsoda wash.—*

Lump lime .....	20 lbs.
Sulphur .....	15 lbs.
Salsoda .....	10 lbs.
Water .....	50 gal.

"Put five or six pailfuls of hot water in a wooden barrel, preferably a thick pork or oil barrel, add the lime, quickly following that with the sulphur and the salsoda, and stir till the slaking is practically completed. It may be necessary to add cold water at intervals to keep the mixture from boiling over. When boiling ceases, cover barrel with burlap and allow it to stand fifteen to thirty minutes or more. This mixture is advised when the conveniences are wanting for the preparation of the boiled sulphur wash." (Dr. E. P. Felt.)

## COST OF SPRAYING MIXTURES.

With copper sulphate at \$7.00 per cwt., Paris Green at 25c. per lb., arsenate of lead at 14c per lb., lime at \$1.10 per barrel, sulphur at \$2.50 per cwt., caustic soda at 5c per lb., salsoda at 2c per lb., kerosene at 12c per gal., limoid at \$2.50 per barrel, Scalecide at 50c per gal., crude petroleum at 11c per gal., whale-oil soap at 4c per lb., and crude carbolic acid at 39c per gal., the cost of raw materials for making one barrel, fifty gallons, of the several mixtures is as follows:

1. Bordeaux mixture .....	\$ 38
2. Bordeaux mixture with $\frac{1}{4}$ lb. Paris green.....	14
3. Bordeaux mixture with 3 lbs. arsenate of lead .....	80
4. Lime-sulphur wash .....	50
5. Lime-sulphur-salsoda wash .....	70
6. Lime-sulphur-caustic soda wash .....	81
7. Kerosene-Limoid wash (10 per cent. oil) .....	82
8. Kerosene-Limoid wash (15 per cent. oil) .....	1 23
9. Kerosene-Limoid wash (20 per cent. oil) .....	1 64
10. Scalecide (5 per cent.) .....	1 25
11. Scalecide (8 per cent.) .....	2 00
12. Scalecide (10 per cent.) .....	2 50
13. Crude petroleum .....	5 50
14. Kerosene emulsion (10 per cent oil) .....	65
15. Kerosene emulsion (25 per cent oil) .....	1 56
16. Crude petroleum emulsion (10 per cent. oil) .....	67
17. Crude petroleum emulsion (25 per cent. oil) .....	1 67

## REPORT OF COMMITTEE ON RESOLUTIONS.

We desire to place on record an expression of our warm approval of the action of the Dominion Government, in having, in response to the request of this and other organizations, procured the passing of legislation placing the control of express rates in the hands of the Railway Commission.

We hope the action of Parliament in giving a legal definition to No. 2 grade of apples will have the effect of giving to the produce of Canadian orchards a still better standing in the markets of the world.

We desire to express our thanks to the Hon. Sydney Fisher for his action in calling a Dominion conference of fruit-growers last March, a conference



which resulted in harmonizing many little antagonisms between the Provinces, in bringing fruit-growers from all parts of the Dominion together for united action, and in giving a still further impetus to what has become a great national industry.

We believe the thanks of every commercial fruit-grower in Ontario are due to Alexander McNeill, chief of the Ottawa Fruit Division, for the remarkably full and correct reports issued by him during the late growing season in regard to fruit conditions and prospects—reports which placed growers in a measure on a footing of equality with buyers in regard to factors governing market conditions.

We would, however, strongly recommend that fuller information than we have now be given in regard to crop conditions and market prospects in other countries, and that to this end the Department of Agriculture at Ottawa be asked to secure the co-operation of the Department of Trade and Commerce in securing reports from Canadian commercial agents in Great Britain, Australia, and South Africa, in regard to probable production before crop maturity; also that the co-operation of horticultural associations in the United States be secured, and an exchange of timely information with these be arranged for.

We regret that, aside from the action taken at Ottawa, resulting in placing of express rates under the control of the Railway Commission, comparatively little has been done in regard to transportation during the present year. We most strongly urge that action be taken by the Transportation Committee during the coming year, looking to a material reduction in freight rates on apples, and a sweeping cutting down in express rates on all lines of fruit.

That this association would urge the Minister of Inland Revenue for the Dominion to amend the Act respecting staple commodities (that *re* fruit baskets) in accordance with the resolution passed by the fruit associations, and that the Government make, and stamp the forms and issue them to the basket manufacturers to ensure uniformity of fruit packages.

That inasmuch as a large number of fruit-growers are using carbonic acid gas as a source of power in their spraying operations, and as a great deal of difficulty has been experienced in securing a satisfactory supply in Canada, we would respectfully urge upon the Dominion Government the desirability of instituting some system of registration of the containers, so that these containers might pass freely to and from the United States, duty being levied upon the gas only. By this means a satisfactory supply might be available, and spraying operations greatly facilitated.

We strongly urge that the Department of Agriculture for Ontario, in addition to what is now being done and in addition also to what has been asked in the resolution adopted on the motion of Mr. Peart, arrange for obtaining special reports, after fruit has set, from the most reliable growers from the sections in which fruit is largely grown.

We strongly approve of the main point in the Robertson resolution, namely, that legislation be asked which will provide that nurserymen shall guarantee their stock as true to name, and that where the promise is not fulfilled, a reasonable and just penalty be imposed.

We are delighted to note the extension of the co-operative movement among fruit-growers in the Province; regret that comparatively little has been done this year in the extension of this movement by this association, and strongly urge that an officer be appointed whose duty it shall be to give his whole time to the encouragement of organizations now formed, and to creating of new ones.

That we desire to show our unbounded gratification at the splendid public spirit shown by Mr. Rittenhouse of Chicago, in giving a farm for experimental work in tender fruits, and in the prompt action of the Ontario Department of Agriculture in providing for the equipment of the same.

That a deputation visit the Minister of Agriculture for Ontario before this convention adjourns to press for the Ontario legislation asked for in this and the Peart resolution. Also that copies of resolutions relating to Dominion matters be forwarded by mail at once to Hon. Sydney Fisher.

We desire to place on record our warm appreciation of the invaluable services rendered by the directors of this association, many of whom have served long terms in office, frequently at serious inconvenience to themselves. We recognize also the splendid spirit shown by these same directors, now that a new stage of development is called for, in so frankly joining in the movement to make the organization more representative than it is at the present time.

That the thanks of the Association be extended to Mr. Hale of Michigan and Prof. Parrott of New York for their valuable addresses and their attendance at the meetings.

On motion, the report of the Committee on Resolutions was adopted.

On motion of Mr. Harold Jones, seconded by Mr. G. C. Caston, the following gentlemen were nominated by the chair to wait upon the Provincial Minister of Agriculture forthwith and place before him the resolution adopted by the convention in reference to the gathering of statistics by the Province respecting the fruit industry: W. H. Bunting, Murray Pettit, Wm. Orr, Harold Jones, Elmer Lick, H. H. Groff.

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## THE FUTURE OF THE APPLE IN ONTARIO.

By A. McNEILL, CHIEF OF FRUIT DIVISION, OTTAWA.

If the subject of my address had been chosen by myself, it might have been suspected that I laid some claim to the prophetic faculty. Such is not the case, however, and whatever conclusions I shall draw are based upon facts, a few of which I shall present to you this afternoon; you will be just as capable as I of judging whether the conclusions arrived at are correct or not. My object in bringing these facts before you is largely for the purpose of having them criticized, as I am not sure that the conclusions I am drawing are final; or at any rate, I am not so sure but that I shall welcome any criticisms you may make respecting them.

Apple growing is the largest fruit interest we have, and the future promises a still greater expansion for this industry. The apple and its products account for nearly five million dollars of the exports from Canada and, with mixed farming, the domestic trade certainly amounts to five if not ten times that amount. The extraordinary development of the apple growing industry in some parts of Ontario in the last few years on the one hand and, on the other, the complaints we hear respecting it from some sections, some of which were voiced by the Provincial Minister of Agriculture in his address, indicate that there is an extraordinary condition of affairs surrounding the industry. It is part of my purpose to endeavor to explain some of these seeming anomalies. I have no hesitation in confessing that in dealing with the subject I have kept the industrial end—the money-making end—constantly in view, and that I am not referring to the growing of apple trees



simply for the pleasure of growing them, nor for the purpose of providing a supply of fruit for home consumption. My thought is simply to investigate with the object of putting the apple growing industry on such a basis that the producer may get the most out of his efforts in orcharding.

The map before you will illustrate my subject. This map shows four districts in Ontario in which the apple is an important product. Parts of the Province are not suitable for commercial apple growing, but the remainder of the Province I have divided into four districts where the industry is of importance and where it may be followed with very great profit. To understand the differences that exist between these districts, it is necessary to consider somewhat their physical features and climatology, as these determine to a large extent the development of the industry. You will bear in mind that there is no distinct line of demarkation between these districts—the one shades imperceptibly into the adjoining one.

The District marked No. 1 comprises the Lake Erie group of counties, including the western end of Lake Ontario. Here there are about two million apple trees of bearing age. It is the Canadian peach belt, where the peach, plum, quince, sweet and sour cherry and the smaller fruits are, generally speaking, perfectly hardy. There is a marked difference between the temperature of this district and that of District No. 3. By May 8th the Ben Davis apple will be in blossom at Windsor, but it would not be in blossom at Lindsay until at least two weeks later. At Windsor no frost would be expected that would kill the leaves of the grape previous to October 10th or 15th, but in District No. 3, or in the greater portion of it, September 15th will often bring a frost sufficiently severe to touch tender vegetables. While there may be just as high temperatures in District No. 3 as in No. 1, the periods of heat are of shorter duration. The result of these conditions is that the apple starts growing two weeks earlier in District No. 1 than in District No. 3, or in the greater part of District No. 2. Then during the summer months it is subjected to a higher average temperature, which condition continues well on into October. The effect of this is that winter apples in this section are mature perhaps a month before they are mature in Districts No. 2 and No. 3, the practical effect of which is to put District No. 1 out of business, when ordinary conditions prevail, so far as the winter apple trade is concerned.

To-day the people of this district are wondering why the apple trade is not prospering with them. Notwithstanding the apparent scarcity of apples this year, there are thousands of bushels wasting in this section. Although the explanation is an easy one, there are a good many people who do not see it. The apple buyers' explanation is that the winter apples growing in this section do not keep. This is not really the case. The fact is that the buyers have discovered a source of supply the apples of which may be held on the trees three to five weeks later in the season, which makes the fruit more profitable to handle from the exporters' point of view. It is not that the apples of this district will not keep, but that they mature three or four weeks too early for the best export trade. For this reason the buyers have abandoned the district so far as winter apples are concerned, and while a certain class still do business there, they purchase only such apples as they can see an immediate market for. The district is obliged to market its apples under ordinary conditions by the end of November, or at least before Christmas, and if the market is not good at that time, the buyers are apt to throw up their bargains, and are in any event very cautious about making them.

This is not the case in portions of Districts Nos. 2 and 3, because there the apple operators can buy with confidence, for the reason that they know



#### EXPLANATORY NOTES ON MAP.

District No. 1 grows all the tender fruits, such as peaches, apricots, dwarf pears of all varieties, tender and all varieties of apples, plums, pears, cherries, etc. This region is specially adapted to early fruits and vegetables, being from ten days to two weeks ahead of the districts surrounding the large markets.

District No. 2 grows excellent winter apples of all varieties to perfection. It is characterized by a large number of comparatively small orchards containing numerous varieties of fruit. Many portions are excellently adapted for plum and pear culture.

District No. 3 is specially adapted for winter apples. There are many large orchards especially on the shore of Lake Ontario. The farmers here are making a specialty of orcharding. District 3(a) on the Nottawasaga Bay should be classed with District 3, having large orchards of comparatively few varieties of winter fruit.

In District No. 4 the ordinary winter varieties are not hardy. This District, however, grows Fameuse, McIntosh Red, Wealthy and Wolf River to perfection. The first two are dessert apples that if properly packed should command the very highest prices as dessert apples. District 4(a), the mid-land counties of Western Ontario, on account of their altitude, must be classed with District 4. In this district the ordinary winter varieties grown in the adjacent counties are not hardy.



they have an apple which they can store if the market is not good, and if they have to hold them even for a considerable time, the loss is a small one. This explains why the industry has not prospered of late years in District No. 1. It is not the apple that is to blame. It was in this district that the first apple orchards were planted, and where the apple reputation of the Province was made, and there is no finer fruit shown at our Exhibition than that which comes from this section; it is highly colored and of splendid flavor and of good size. The finest Baldwins, Spys and Kings I ever saw were grown in this district, but they have one defect that offsets all their virtues as winter export apples: they are not good keepers. The farmers here planted winter varieties more numerous than medium and early varieties, for the reason that even in the early history of orcharding in this Province, there was a surplus of early fruit; consequently, they now find themselves with orchards that are not as profitable as they should be. There is, however, still a possibility of making these orchards valuable assets. Had organization been effected and had intelligence been put into the business, there need not have been a single apple wasted. The remedy lies first in organization into co-operative associations by means of which these apples might be sold during the months of September, October and November. I believe that there is a market for every apple grown there that could be sold before Christmas. There are two markets to which I would draw special attention. First, that of the North-West; I cannot be too enthusiastic about the North-West market for apples. I am prepared to risk my reputation on the statement that this market is opening up faster than we are prepared to supply it. In the past the population has been thinly scattered over a wide extent of territory, and there was not enough at any one point to enable growers to reach them in carload lots. The cost of distributing and other expenses made the fruit so high in price that consumption was nearly nothing. Now, there are hundreds of little stations on the different lines throughout the Western Provinces, each getting a population large enough to take fruit in carload lots. Large warehouses are being established at many points, and they are now taking a carload per week for distribution in many places. At Regina there are two large distributing warehouses, two more have been built at Calgary, and at Lethbridge one of the best in Canada is being opened. It is a splendid concrete building with cold storage and all modern appliances. At Moosejaw, Edmonton, Saskatoon, and other points we shall see a similar development in the next few years, and the person who is in a position to put early apples on the markets of the West is bound to make money.

The early apple market of Great Britain is one that has always been neglected. It has been supposed that we could not sell early apples there if the apple crop in Great Britain was a good one; but, with our present system of cold storage transportation, we can put early apples on that market and can compete with the English grower to advantage, so that we are practically on even terms with him. We have three advantages: first, a better quality of fruit, not better than the best English fruit, which is no doubt ahead of our best, but better than the average run of the commercial orchards of Great Britain; second, it is packed uniformly and honestly; and third, there are large lines of it, which gives it one of the greatest advantages of all over the small lots of English grown fruit. The large English distributing firms would rather handle Canadian apples than the home grown product, because the latter comes in small lots, variously packed and of many varieties. We have the influence of these large brok-

erage firms on our side, and, if we do our share as fruit growers, we shall have our share in the early apple trade of Great Britain.

In evidence given before the Departmental Committee appointed by the Board of Agriculture and Fisheries to enquire into the Fruit Industry of Great Britain, Mr. W. Chambers, a fruit grower in Kent, Eng., said:

"The fruit that is sold there is of a better color than we can under any circumstances produce; for instance, the apples that are brought from America and Canada. We cannot grow such beautifully colored and handsome fruit; I do not think that by any cultivation or management we can come up to the sample that is sent us from abroad."

Mr. Wm. Craze, a fruit grower in Cornwall, Eng., said:

"It appears to me that the success of the Canadian and American apple trade is mainly on two lines, leaving the grading out. First, the barrel is of the same weight practically, whoever it is packed by, and is non-returnable. The second great advantage is that a barrel of Baldwins, Spies or Greenings can be repeated next day, and right through the autumn and winter, whereas in our English apples you get a consignment of forty or fifty bushels to-day, and you say to two or three good buyers, "These are the sort of thing that will suit you," and you may see no more of the same kind that season. The point to put before the growers is that they have too many sorts. There are four or five principal sorts in Canada and America. Three million barrels of apples came to Great Britain this year, principally of five varieties."

Mr. J. W. Dennis, fruit merchant in London, said:

"From a market point of view a great many varieties are bad. The result of it is that as soon as the American and Canadian apples come upon the market the best retailers, who ought to be the best customers for the British fruits, leave them severely alone because they cannot get a continuous supply. The customer finds that a certain apple goes, and he comes back the next day or week and wants the same, and immediately the American and Canadian barrels come in, the shopkeeper will buy them; that is why he leaves the British fruit and takes the Canadian or American fruit."

Mr. Thos. Russell, fruit merchant of Glasgow, in reply to the question, "And you find that the Canadian packing is very good?" said:

"Canadian packing is A1. We cannot get better packing anywhere now. We have a few brands that, on account of the packing, will bring shillings a barrel more than other apples. The Canadian fruit growers are fined if their fruit is found put up not in accordance with the standard. The Canadian Government has inspectors at all the ports and large centres."

I would not speak so confidently of this trade had it not been going on successfully for the last three or four years, during which time some early apples have been shipped every year. This year there was a good crop in Great Britain, and Canadians were afraid to ship early apples there, but the fact remains that prices for early apples were exceedingly satisfactory, and that the market could have absorbed three times as many as were sent.

Here I may say that there is some misapprehension on the part of our growers as to the transportation facilities that have been provided for this early trade. They fail to appreciate the fact that we now have the best system of transportation on the continent of America, if not in the world. At the present time the safest period in the life of the apple is the time it spends in travelling between Montreal and Liverpool or Glasgow. The conditions on board ship are so uniform and the checks so perfect that I see no reason why there should be a breakdown in it. Its reputation is



now well established, and I have no hesitation in claiming that this link in the chain of transportation is now practically perfect.

The refrigerator car service is only fairly well managed. The weakest link, however, in the system is the one from the picking of the apple to the placing of it in the refrigerator car. When the people of District No. 1 learn the value of cooling their fruit before it is put in the package as soon as it is off the tree, and then keeping it cool, there will not be the slightest difficulty in putting our tender fruits on the markets of Great Britain.

With regard to District No. 1, I would advise that in new plantings early varieties, such as the Astrachan, Duchess and, perhaps, the Wealthy, preponderate, as they can catch the high prices at least two weeks ahead of the rest of Canada. If the present orchards of this district, with the late varieties, are vigorous, by all means retain and care for them, utilizing the fruit by selling it immediately on the English market or to the North-West or by doing as they have done in New York State in establishing a system of cold storage in which these winter apples could be placed as soon as they are properly matured. Then they would be on equal terms with the growers of other districts, except that the cold storage would add to the cost of production 25 to 40c. per barrel.

I may suggest here, too, that proper cultural methods will help wonderfully to improve the keeping qualities of the fruit. What is required is to prevent the maturing of the fruit; keep it growing as long as possible. This can be done by making the orchard soil very rich and keeping up clean culture late in the season. Where this was done in cold season with plenty of moisture, such as 1903 and 1904, winter apples stored with little or no loss.

District No. 2 includes the second tier of counties north of Lake Erie, and may be considered in conjunction with District No. 3, which comprises the southern ends of the Lake Ontario counties, that is to say, from the shores of Lake Ontario northward to about as far as the line of the Canadian Pacific Railway, or a little further north in some sections. So far as the climate is concerned, these two groups are very similar. They are the districts in which the winter apple grows to perfection and keeps the longest.

District No. 2 has a peculiar history, as it is a region of small orchards with many varieties, two factors which have a very important bearing on the apple growing industry in the section. In the aggregate there is a large number of bearing trees, but they are scattered over every farm in lots of from two to five acres, each orchard having from ten to fifteen varieties. Along the shores of Lake Huron there are a very few large orchards, but they are rare. This makes it difficult and expensive for the apple operator, and consequently he does not pay a high price for these apples. The reputable and large apple buyers do not find this a congenial field of operation. They have to deal in such small lots and with so many people that the mere burden of buying becomes intolerably irksome as well as expensive. In too many cases the legitimate apple merchant is replaced by the irregular buyer who has neither money nor proper selling connections, but who offers an absurdly low price in the hope that he can turn over his holdings to a regular dealer at a big profit. If he fails in this he repudiates his bargain with the grower, who has no recourse.

The remedy, of course, is to pack and sell co-operatively. Indeed, this is now being done with splendid results. When these have had their time to show their full effects, I confidently expect that there will be no feature of the system of mixed farming that is followed here that will yield such good returns as the orchard.

On the other hand, District No. 3 is a region of large orchards of few varieties where dealers can get large quantities of one or two varieties with comparative ease. Orchards of twenty and twenty-five acres in extent are numerous, while ten acre orchards are quite common. Extending back from the lake front in what is known geologically as the basin of the old Lake Iroquois, is a country that is particularly well adapted to the growing of winter apples. You hear no complaints in this district about apples not paying. Many men here with ten acres of orchard have sold their apples in a lean year for as much as the rest of the products in the one-hundred acre farm were worth. Last year as much as from two to three thousand dollars was paid for the product of some comparatively small orchards. With this district I have included a small section of country adjoining Nottawasaga Bay, an extension of Georgian Bay (3a on the map). This territory consists of the north-eastern slope of the Niagara escarpment, which at this point again becomes steep and bold. On the slope of the "Mountain" are found some of the finest orchards in the country, and the section is as favorable a spot for growing winter apples as exists anywhere. I know of no place where apples can be grown to better advantage. Some very large orchards have been planted here which are paying the owners well.

District No. 4 comprises the western midland group of counties, including Perth, Wellington, parts of Grey, Waterloo, etc. (4a on the map), and also the Ottawa and St. Lawrence valleys, and the country lying north of District No. 3. The western midland counties may be regarded as the Highlands of Western Ontario, although it is a fact that is not generally recognized as the increase in elevation as you proceed inward from Georgian Bay is very gradual. Nevertheless, it is a fact that at Durham you are 1,100 feet higher than at Goderich. In British Columbia an abrupt elevation of 1,100 feet would give you almost a mountain range, and although it is not so noticeable in Ontario, it makes just as much difference in regard to climate as it does in British Columbia, a difference which has a remarkable effect upon the growing of apples. This district is in reality the watershed of this portion of the Province, and so far as apple growing is concerned, we have to classify it with sections of the Province that are considerably farther north. The tender class of winter apples are not hardy at all points in this region, and are, therefore, not a safe proposition for the orchardists, and my advice to growers would be not to attempt to produce those varieties on a large scale.

So far as the northern portion of the Lake Ontario counties and the St. Lawrence and Ottawa valleys (District No. 4 on the map) are concerned, I cannot recommend the growing of winter varieties. At the same time, there is as great a future here in apple growing as in any of the other districts mentioned. Here is the home of the Fameuse type, including the McIntosh, Wealthy, Scarlet Pippin, etc. The people in this district have the opportunity of developing an enormous dessert trade in these varieties, and these are the ones to which they should devote their attention. There is a large market for these varieties as dessert apples. Boston, New York, Chicago and other large cities will take every apple they can grow. Nevertheless, growers in the district complain that they get only 50c. to \$1.00 a barrel for their fruit. My reply is that as they put it up, it is not worth more. To pack these varieties in barrels is simply to spoil their value as a dessert apple, and unless the growers here will produce a dessert apple and pack it properly in boxes, they will never make the greatest success of the business. If, on the other hand, they will learn wisdom, I do not see any reason why there should not be as great and as successful a business in apple growing here as



in any other part of the country. I am not sure, however, that people always do what is in their own best interest under given circumstances.

May I be permitted, then, to sum up generally the situation in the four districts? It is not at all likely that in the Lake Erie counties (District No. 1) there will be any large plantings of winter fruit. In the peach growing districts the land is too valuable and the profits much larger from the tender fruits, peaches, plums, grapes, etc. It would be unfortunate, however, if the orchards which are now in full bearing, well kept and vigorous, should be allowed to deteriorate. The fruit from these orchards can be utilized, as has been pointed out, either by shipping as soon as the fruit is ripe to the North-West or to the English markets; or, what would be more preferable, by establishing a series of cold storage stations where the fruit could be held if necessary as winter shipping stock. This system of cold storage warehouses is particularly commendable because the cold storage facilities are required for the proper shipping of the tender fruits. It will also be required if this district will take up its legitimate business in apples of growing extra early fruit. There appears to be no reason in the world why this southern tier of counties should not supply for the first two or three weeks an enormous quantity of apples that will be in demand before the other sections have ripe fruit. For the proper shipping of this early stock, it will be necessary to have cold storage stations. Therefore, while I would recommend that for new plantings the fruit growers of this district confine themselves very largely to the early varieties, I would at the same time strongly urge a system of cold storage stations that could be utilized not only for the proper shipping of this early stock, but in preserving the product of the present orchards for winter shipping if necessary.

The recommendation for apple growers in District No. 2 would be to confine themselves quite largely for the present to the winter varieties. There seems to be no reason why in certain portions, especially along the shores of Lake Huron, large orchards should not be planted of these varieties; but, presuming that the present system of small orchards with mixed farming is maintained, the salvation of the industry depends upon the formation of co-operative associations. Co-operative associations, of course, would be of very great advantage for every part of Ontario, but for this particular district with those small orchards of many varieties, co-operation is an absolute necessity to success.

For District No. 3 the recommendation would be to continue to plant the large orchards, making a specialty of winter fruit and of orcharding. Speaking generally, farmers here can more easily take up orcharding as a specialty than in other sections. The winter varieties can be recommended here with perfect confidence inasmuch as this district possesses an advantage over every other part of apple-growing North America, and in no contingency that can be imagined can fruit of this class be grown cheaper and better than in District No. 3. The growers in the southern part of the Province as well as in the States south of us, are all at the disadvantage of having to use cold storage which, in addition to adding from 25 to 40c. a barrel to the cost of production, is liable to produce certain losses which are not at all to be feared north of Lake Ontario.

District No. 4 can make orcharding a success on a large scale only by catering to the fancy dessert trade. This the growers of that district can do with the McIntosh and the Fameuse so as to produce a revenue equal to if not greater than anything that can be produced in other portions of the Province. The flavor and keeping qualities of these two apples are such, grown in this section, that they can be boxed and shipped so as to present

an unrivalled appearance when they are placed upon the markets either of the Old Country or of the large cities in our own country or in the United States. A fortune awaits the man who will take up the growing and packing of the Fameuse and McIntosh as a fancy dessert apple.

Speaking of the Province as a whole, one cannot but be impressed with its extraordinary capacity for producing this king of fruits. It possesses within itself almost all the requisites, and it is safe to say that it will take the first place in the markets of the world, as well as in our extensive markets in the North-West, in the production of the best of fruit.

Mr. RICKARD, Newcastle: I am very much pleased with Mr. McNeill's address. It has brought forward a number of important facts which it is well for us to remember. He has sized up conditions very nicely and in a way that shows he has a thorough knowledge of the different sections of the Province. I live in one of the best winter apple districts, and there the apple industry is on the increase. In the township of Clark we have from 200 to 300 acres of winter apples within a square mile; and the apple growing industry is there the most important one from the financial point of view, as it means hundreds of thousands of dollars in that section. This money comes largely from across the ocean, as most of our apples go that way, and are likely to continue to do so. We have no fall apples in that section, as they have not been planted, and it may be that some of the winter varieties grown in District No. 1, which come in three weeks earlier than our own, might find a place on our local markets.

## MARKETS OF THE NORTH-WEST—TENDER FRUITS.

BY ROBERT THOMPSON, ST. CATHARINES.

You are doubtless aware that three years ago the government authorized Prof. Reynolds of the Ontario Agricultural College to make an experimental shipment of two cars of fruit to Winnipeg, one from Grimsby and another from St. Catharines. Previous to that time a few spasmodic shipments of from two to five cars in the season had been made. I do not think there was more than that from one town, if we do not include grapes and apples. These shipments were somewhat unsatisfactory on the whole, being sometimes good and sometimes bad. If the market happened to be good at Winnipeg, we got no more than factory prices, and if the market was glutted we had to pay the freight, which happened on more than one occasion. The report of the Government shipments has already been published. Since then the growers in the St. Catharines district have felt that this was a market that should be taken advantage of. We had our co-operative association and our cold storage building, and we decided to try to utilize that market. Therefore the year following the Government shipments, the association sent out in the neighborhood of twenty cars, but the growers who contributed did so at their own risk. If you had asked the opinion of the majority of the growers who took part in these shipments, they would no doubt have stated that they were a failure, but to those who contributed to all or nearly all of the shipments the results were sufficiently satisfactory to induce them to again go into the business this spring. In this year's shipments there has been a great improvement in this respect. It is very gratifying in looking over the names of the shippers to find that from twenty-five to thirty appear in connection with the majority of shipments instead



of only four or five in the year previous, and all the more so when we consider that this year about fifty carloads were forwarded. I think these men will admit that they have been well satisfied with the results.

Coming to the lessons learned, I want first to impress upon you the necessity for co-operation if you intend to take advantage of that market. It is useless for two or three individuals to think that they can send forward a car occasionally and obtain really satisfactory results. The shipments must be continued regularly throughout the season. In making this statement I, of course, refer to mixed fruits. The next point is that in order to receive the best returns from that market, you will have to put your fruit up in the way they want it, and always see that it is shipped in good condition. This necessitates care being taken that it is gathered at the right stage of ripeness and that it is properly cooled before being placed in the cars. In this connection the records of the thermographs in the cars have been very interesting. These the Department at Ottawa placed at our disposal. In cases where the fruit had been cooled to 40 or 45 degrees before being placed in the refrigerator car, the thermograph showed that the temperature dropped within about twenty-four hours to that same temperature, and did not rise above it during the rest of the journey. If, however, only one quarter of the fruit had been cooled previously, it sometimes took sixty hours for the temperature of the car to get down to 40 or 45 degrees, if it got there at all.

Another advantage of co-operation is that you can divide your car between various kinds of fruit, not overloading with any one kind, which was one of the causes of failure in the earlier shipments. One car would carry too many tomatoes, another too many pears, another too many apples for the market to absorb at one time, and low prices resulted. Another advantage is that, where a number are contributing, you are able to load your cars very quickly and to name certain days in each week on which fruit will be received. The growers can then bring in their consignments of fruit on these days, and you are sure of having enough to fill the car. The next advantage is that by co-operating and making regular shipments you can deal with the railway companies on a much more satisfactory basis. If you are prepared to ship 50 or 60 cars, the railway companies will vie with each other in giving you a good service. Another advantage is that an association can get better information as to the market demands than can the individual grower. Nearly all of the larger associations have their own icing station, and are thus enabled to ice their cars twenty-four hours before the fruit is put on board. When it is ready to leave, the car is re-iced.

During the past season a few of us sent consignments of strawberries to the North-West with partial success. The early shipments went through well and commanded good prices. The berries compared favorably with those from British Columbia and Missouri, but were not quite so good as those from the Ozarks or those grown in the neighborhood of Vancouver. The variety called the MacGowan went through in the best shape, but the Williams was the variety chiefly sent, and netted as much as from \$2.00 to \$3.50 per crate. A few cherries were sent, and they went through in good condition and realized fair prices. In shipping tomatoes we had learned a lesson from the previous years. We found that we had been sending our tomatoes too green, and that they did not want green tomatoes and prices were low. We found that if they could be picked at exactly the right stage, they would arrive in good condition and sell at good prices, but that if sent too ripe or too green, they would not bring within 25 per cent. as much. This year our shipments were very satisfactory and brought us better returns than our peaches. Most of our tomatoes were packed in boxes, but at the

same time it would be a mistake to make a full consignment of fancy grades, as the market requires and is able to take a certain proportion of a second grade article.

In regard to peaches, the weather during the season was unusually dry and hot, and the fruit spoiled much less quickly on this account. As a consequence our peaches shipped better than in years past, and their quality was not altogether owing to packing, etc. The majority of our peaches were packed in boxes, and the price received was better than we obtained at home. They carried almost invariably in good condition. We placed some in every car, starting with Triumph, Early Rivers and following up with Smock, etc.

Q.—What was the size of the box?

A.—They were 20 pound boxes and the fruit was in two layers. There is a good market in the North-West for our pears in part carloads. The report we received from different points was that our pears compared favorably with those from British Columbia, that although they were not quite so large, they were of better flavor and kept somewhat better. British Columbia is not shipping out pears to any extent, owing to the pear blight.

Q.—What variety did you send?

A.—We started with Wilder and finished with Keiffer. I believe that the future of our early apple trade is with the North-West. If they are properly handled, they will realize good prices. In regard to the competition of British Columbia in the North-West market, I came back from my western trip last spring feeling that I was fully justified in advising my neighbors to stay right in Ontario, and that there is a better future before the fruit business in Ontario during the next twenty years than there has been during the past twenty. I do not think we need fear the competition of British Columbia for twenty years to come, and not then in some lines. They can never grow grapes to compete with us commercially, as their nights are too cold. With regard to temperatures, I saw four degrees of frost when plums, pears and peaches were in blossom, and they will admit that they sometimes get it as low as twenty-six below zero during the winter months.

I found that there was a prejudice against some of our fruits at some points in the North-West, but I did not find a dealer from Calgary to Winnipeg who would not admit that he preferred Ontario apples because of their flavor and keeping qualities, provided he could depend on packing. Another thing I found was that they did not want our tomatoes, complaining that they were wormy, etc. I therefore made a shipment early in the season, and asked them to send me back word as to how they compared with western tomatoes. I got a reply by mail that they were the best they ever had had, and to send two shipments a week. In the first car sent to Calgary we placed a certain number of packages of tomatoes, and the moment the car arrived a telegram was sent to us to place 200 boxes in the next car. They had never received tomatoes like those, and my conclusion is that the west cannot compete with us so far as tomatoes are concerned. The only line there is any competition in is in apples, but they have disadvantages in connection with labor, weather, etc., while their country is divided into small isolated valleys where shipment is often a very difficult matter. My conclusion, therefore, is that we are in a better position to place apples on that market than they are, and that we can sell them cheaper and will make more money.

I find that the majority of individual shippers look upon packing in boxes as a bugbear, but where there is an association and a packing house,



the cost is a comparatively small item, as it is quite possible for an experienced hand to pack one hundred boxes per day. You can wrap and box pears and peaches at a cost of from five cents to eight cents a box, provided the work is done on a co-operative basis.

## REPORT OF TRANSPORTATION COMMITTEE.

The report of the Transportation Committee was presented by the Chairman, Mr. W. H. Bunting, of St. Catharines:—

There has apparently been some criticism of the committee's work this year, but I think I am justified in saying that the lack of action on their part has been more apparent than real. At the Dominion Fruit Conference in March last the question of transportation was pretty thoroughly discussed and a number of resolutions were endorsed by the conference bearing on this matter, but in the meantime it was felt that some better preparation should be made before taking decisive action in connection with these resolutions. The committee has therefore been gathering data on which to make out its case. Now that the express companies have been placed under the control of the Railway Commission, it is the desire of the committee to prepare a statement of the grievances which we as fruit growers have labored under in the past, in order that our case may be presented to the Commission in such a way as will carry weight and probably secure redress for these grievances. Up to the present time it has been almost impossible to secure any concession from the express companies as they are interested parties, and any representations made to them were pigeonholed, but we now have a tribunal before which any grievances may be laid. On behalf of the committee I should like to ask the members of the Association to tabulate and present to this committee any information they have which they consider would be of assistance in making out a case.

With reference to the general transportation questions by freight and steamship lines, the following resolutions were passed at the Fruit Conference:—

Resolved that the Railway Commission be requested to order:—

(a) That a time limit for the transportation of perishable fruits of not less than twelve miles per hour be put in force upon the railways of Canada, which time limit if not maintained shall place the onus of responsibility upon the carrying company if loss or damage is sustained thereby.

(b) That when the railway companies fail to furnish suitable equipment for the transportation of fruit within six days after the time an order is placed with the local agent, a penalty be provided for each subsequent day's delay.

(c) That icing stations be established at divisional points on all railways engaged in the transportation of fruit, and that cars fully iced be furnished when requested by the shipper.

(d) That at all stations where fruit is customarily loaded in car lots, shelter from sun and rain shall be provided.

(e) That when requested, shippers of perishable fruit shall be furnished by the local agent with a daily report of the location of a car of fruit while in transit.

(f) That a rate for transportation of apples be put in force that shall correspond with the present rate for flour, until such time as the railway companies furnish satisfactory equipment and service.

Resolved that the Dominion Government be memorialized to enact such legislation as will result in placing the express companies operating in this country under the control of the Railway Commission.

That we desire to recognize the value and importance of the assistance rendered by the Dominion Department of Agriculture in improving the conditions prevailing, both with reference to the home and foreign trade, and would request a continuance of these efforts as far as possible.

That copies of these resolutions be forwarded to the Dominion Government, the Railway Commission, and the various railway and express companies interested.

As I have already intimated, the resolution in reference to express companies has received the approval of the Dominion Government and these companies have now been placed under the control of the Commission. In reference to the other resolutions, the committee is still gathering data, and will endeavour to present a case before the Commission which will appeal to its judgment. From my own observations, I am inclined to think that the railway companies have already anticipated some action of this kind. The resolutions I have quoted were considered reasonable and fair to the carrying companies, and we have every hope that the Commission will order that they be put into effect.

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## PROTECTION OF FRUIT TREES FROM MICE AND RABBITS.

By W. T. MACOUN, HORTICULTURIST, C. E. F., OTTAWA, ONT.

Every year thousands of trees are injured in Canada by mice, and, in the newer districts, a large number by rabbits also. There could be nothing more discouraging to a fruit grower, or would-be fruit grower, than to see his orchard which he had cared for, perhaps, for five or six years, the trees in which were just beginning to bear, ruined by mice; and yet this frequently happens and the man loses courage, and in many cases, doubtless, does not replant. All this could be prevented if the farmer or fruit grower would use the information which has been published time and again in the newspapers and periodicals, and protect his trees from mice. Some years there is less injury than others, and this fact, like a year when there is no apple spot, leads to carelessness, and when a bad year comes the trees are unprotected.

While the depredations from mice and rabbits in winter vary from one year to another, depending on the scarcity or abundance of food, the number of mice which are in the vicinity, and the character of the winter, the injury is always greatest when the orchard is in sod, and when there is rubbish lying about: hence the latter should be removed before the winter sets in. In most cases it is not necessary or advisable to have the orchard in sod, particularly when the trees are young, although it is highly important to have a cover crop, which is also sometimes a harbor for mice. As mice may be expected in greater or less numbers every winter young trees should be regularly protected against their ravages. Mice usually begin working on the ground under the snow, and when they come to a tree they will begin to gnaw it if it is not protected. A small mound of soil from eight to twelve inches in height raised about the base of the tree will often turn them, and even snow tramped about the tree has been quite effectual, but the cheapest and surest practice is to wrap the tree with ordinary building paper, the



price of which is merely nominal. Tar paper is also effectual, but trees have been injured by using it, and it is well to guard against this when building paper will do as well. Last winter Mr. G. C. Miller, Middleton, N. S., at the meeting of the Nova Scotia Fruit Growers' Association, reported injury to 800 trees from tar paper. It would appear that some brands of tar paper are more injurious than others, as many use it without injury to the trees. After the paper is wrapped around the tree and tied, a little earth should be put about the lower end to prevent the mice from beginning to work there, as if they get a start the paper would not stand in their way. It may be stated, however, that although at least two thousand and young trees are wrapped with building paper yearly at the Experimental Farm at Ottawa, there have been practically no instances where the mice have gnawed through the paper to get at the tree. The use of a wire protector, or one made of tin or galvanized iron, is economical in the end, as they are durable.

In the North, protection from sunscald is almost as important as protection from mice. At the Central Experimental Farm we have for several years been using wooden veneer protectors for the standard trees, as these protect from mice and on account of being loose about the tree leave a good air space which appears to protect the tree from those sudden changes of temperature which seem to be the main cause of sunscald. These veneers cost \$5 per thousand, and can now be obtained from the Oakville Basket Co., and perhaps from other Canadian firms. As those sold in Canada are only eighteen inches in length, it is necessary to use two for each tree, if it is desired to protect trees from sunscald, although we believe a longer veneer could be obtained if specially ordered.

For the past two winters an experiment has been conducted at Ottawa in painting the trees to protect them from mice. In neither of these winters have the mice been very bad at Ottawa, so that the results so far are not very conclusive as regards protection from mice. It may be said, however, that none of the painted trees were injured by mice, while a few of those left unprotected were injured. It may be stated also that no injury to the trees from the paint has so far been observed. Paint has been used at the Virginia Experiment Station for more than fifteen years with good results, they not having had an apple tree injured. It is not, however, recommended for peaches and cherries as some injury occurred from the use of it on these fruits. If paint is tried it should not be bought ready mixed as it may have **some injurious mineral oil**. White lead and pure linseed oil should be mixed together to a consistency about the same as for an outside coat on a building. The tree should be heavily coated with this.

There are a number of washes and poisons recommended for the protection of the trees and the destruction of the mice and rabbits, but none of these are very satisfactory, as if the mice or rabbits are numerous the poison has not sufficient effect upon them to prevent injury altogether.

In Manitoba rabbits are very troublesome. The fruit growers there can protect the trunks of the trees when there is a single trunk, but as their trees branch from the ground in many cases it is very difficult to protect them, and to ensure the safety of the trees the whole of the lower part of the tree should be protected and this cannot be done very well except with a spray. We have suggested spraying with paint. That is a good field of work for the new Professor of Horticulture at the Manitoba Agricultural College.

We shall now discuss the question of treating the trees after they have been injured.

If a tree is badly girdled by mice it usually dies. If as soon as the wound is noticed it is cleaned and covered with grafting wax or some paste, such as cow dung and clay, and wrapped with cloth to exclude air and prevent the wood from drying out, there is a possibility of saving the tree if the girdle is a small one, as the sap which rises through the wood will continue to do so, and returning through the inner bark in an elaborated condition will cause growth to be made all around the upper part of the wound, and if the latter be not too large there is a chance of its healing over. If, however, the wood becomes dry before the bandage is put on, the tree will almost certainly die, although it may continue to grow throughout the season. When the wax and bandage are applied the tree should be headed back considerably to lessen the amount of transpiration of moisture, as there will not be as much sap rise as if the tree were uninjured, and the wood will thus dry out sooner than if it were headed back. If the girdle is near the ground, in addition to covering the injured part with wax or cow dung and clay, it is advisable to mound up the soil about the tree to cover the wound and thus help to prevent the wood from drying out.

Girdled trees are frequently saved, and more surely saved than by the above method, by connecting the upper and lower edges of the girdle with scions, which are inserted all around the trunk. The more scions that are used the quicker they will grow together and form a new trunk, but two or three scions successfully grafted on a small tree will carry enough sap to keep the tree alive. The larger the tree the more scions should be used. A slanting cut is made at each end of the wound in the uninjured wood in which the scions are to be inserted. Strong, plump scions of the previous season's growth—not necessarily from the same tree, nor even the same variety—cut a little longer than the distance between the slanting cuts, are made wedge-shaped at each end. They are made a little longer than the distance between the cuts in order that when inserting the ends into the cuts it will be necessary to bend them, and thus have them under pressure, which helps to keep them in position. When inserting, some of the inside bark of the stock should come in contact with some of the inside bark of the scion, as it is here or at the cambium layer where union takes place. As soon as the scions are all placed the wounds, especially about the ends of the scions where inserted in the stock, are covered with melted wax. The ends are also at the same time bandaged with a cloth around the trunk to aid in keeping the scions in place and to exclude the air. The tree should then be well headed back. The scions, if properly made and inserted, should soon unite with the stock and then carry the sap to the top of the tree.

Another method of bridging is to cut back the uninjured bark evenly all round the trunk and insert the wedge-shaped scions underneath the bark at the upper and lower ends of the wound. There are other methods also employed, such as using a scion bevelled at each end. Also, boring holes with an augur at each end in the uninjured bark, and shaping the scion at each end so that it will fit into it. One of the most satisfactory methods of utilizing the girdled tree is to cut it off close to the ground and insert a scion of some good variety. This graft should grow at least three feet in height the first season and make a nice young tree.

Mr. CUTTING: One grower told me that he had obtained good results from the following method: He did a small portion of his pruning early in the winter and afterwards allowed a small pile of twigs to remain on the ground midway between the trees. These acted as a decoy as the mice preferred the twigs to the older wood of the tree trunks.

Mr. ARMSTRONG: I consider that wrapping the trunks with tar paper is the most effectual and cheapest method.



A MEMBER: Grain poisoned with an arsenic solution and scattered around the fences is a good preventive. It should be done in the fall just before freezing up.

Mr. HILBORN: The veneer is cheaper than paper, because it lasts for two seasons and is put on more quickly than the paper. It also protects the trees from severe cold. We get it cut into pieces about 12 x 18 inches and costing \$2.50 per thousand.

Mr. W. M. ORR: I have used tar paper on thousands of trees for years with perfect success.

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## THE STRAWBERRY.

W. F. W. FISHER, BURLINGTON.

To the apple is universally ascribed the title "King of Fruits," no one for a moment questioning its claim to the position. Equally unquestionable is the merit of the Strawberry, the subject of the present address, to the next highest position of rank, namely "Queen of Fruits," large or small, and equally universally is it accorded its true position.

The term small, with its possible double interpretation, is scarcely applicable to the strawberry; it would rather be more correctly applied to the man who does not enjoy the strawberry season. Probably the feelings of every person present would remain unruffled if we were to say that the man who does not appreciate this luscious, delicious, healthful fruit is either pitied or despised by his fellow creatures.

The strawberry is more cosmopolitan in its adaptation to soil, climate and conditions as well as to palates, than any other known fruit. It grows and flourishes in the sunny south, it is found smiling its welcome in the early spring, and in its season tempting the appetite of the dweller on the prairie of the far north, and at practically all points between, it is possible to produce this fruit. Apart from its intrinsic merit, probably one of the joys with which the strawberry is received is due to the fact that it is the harbinger of the season of fresh fruits extending throughout the year, until its own season comes again.

The importation of strawberries from the United States, it was feared by many, would result in weakening the appetite of consumers and lowering the price of the home grown article. The history of demand and average prices for the past ten years shows a contrary effect, and with the increase of importations and the trebling of the acreage under home grown berries, the demand and price have kept full pace.

Now a few words as to cultivation. The old saying that in order to properly train a child one should have begun with its grandmother, applies with full force here; for, if land has been liberally fertilized, and tilled in such a manner as to keep down all weeds for two or three seasons previous to its being planted with strawberries, half the battle has been fought and won; and with ordinary intelligence applied to later operations success is ensured. While, as we have already stated, this fruit will succeed to a remarkable degree on a variety of soils, the ideal one, in the speaker's estimation, is a rich sandy loam with a quicksand subsoil not too near the surface, but still from which a considerable evaporation of moisture is continuous throughout the season of ripening. Having selected the most suitable soil available, it should be well fertilized and fall plowed. Spring cultivation

should begin early in order to retain moisture, and, in cases where the soil is heavy, to keep it from becoming hard. When ready to plant, which should be during the first half of the month of May, plough deep, harrow, and roll firmly.

The choice of varieties depends largely on extremely local conditions and also on the object had in view as to producing berries for the early market or berries of high quality adapted to stand up under long distances of transportation. As in our tree fruits, many growers fall into the error of needlessly multiplying the number of varieties. Choose judiciously, and keep the number for a commercial plantation down to two or three. A new and profitable demand will be created as soon as large plantations of single varieties of the right sort are offered to buyers. The plants should be taken from well wintered young beds, and all weak plants discarded, trim off all runners and dead leaves, lay the plants straight in a carrying basket, sprinkle well with water and cover to exclude the air. Then they are ready for the field. Planting should be done as expeditiously as possible after digging.

The distances between rows and between plants depend somewhat on the views of the individual grower, and the habits of the variety of strawberry. Rows are popularly placed at distances from three to four feet apart. We prefer the former for the rows, and from fifteen inches to two feet for the plants in the row. Probably the most common form of planting is for one man to carry a spade in one hand and a basket of plants in the other hand, while another man or boy puts the plants in the holes made by the spade and each presses a foot to the earth at the roots of the plant as they pass on. In this manner an active man and boy will plant about one half an acre per day. As soon as planting is through, they should be cultivated and hoed to retain moisture, and to prevent the air from getting at any roots not entirely covered. After this, cultivation should be frequent, about once a week for the first two months. Early runners should be turned into the row, as they invariably form the strongest plants, and the rows should not to be allowed to become matted by late setting plants. Some of our most successful growers allow each parent plant to set but two young plants on either side, but this system of cultivation called the hedge row, is not general, nor is it conceded that it is, generally speaking, practicable. When the frosts of December come, the rows should be mulched in such a way as to protect the plants from the severity of the winter. The following spring cultivation is again necessary, especially if the plantation is to be maintained for a second year's picking.

Now comes the rub: To get the berries picked carefully, regularly and promptly is the knotty part of the problem. Provision should be made a season in advance for a supply of pickers, and these require a great deal of tact in managing. Picking is done by piece work at the generally uniform rate of one cent per box; but a premium of some kind might be given all pickers who by skill and neatness bring in their berries in the most attractive and saleable condition.

Marketing is the next feature in order, and on the services rendered, rather than on the prices charged, by the transportation companies, depends the success or failure, to a greater or less degree, of all our efforts up to this stage. When the crates are thrown three or four feet by a stupid, careless expressman, and landed in one of the old fashioned stuffy ovens, which are still designated express cars, or when the trains run into market three or four hours late, the result is quite different to that obtained when they are reasonably handled, deposited in a well ventilated car, and delivered at their destination on schedule time.



The distribution of the crop is one of the most important factors, and we think the ordinary grower would do well to confine shipments on commission to the larger centres, and allow buyers at local points to supply smaller markets. If all the mouths in the Dominion are given access to a full allowance of strawberries, we need not fear a glut in future markets.

We have here outlined a system involving a large amount of labor, care and expense. What result should the average grower expect from such a system fairly carried out? Placing the average crop at, say, 7,500 quarts per acre and the average price at 6 cents at railway station, we get thus the sum of \$450 as the gross receipts per acre. From this deduct the following charges: Plants required, \$25; cultivation, \$25; fertilizers, \$35; rent, \$15; picking, \$75; packages, \$75; packing and delivering, \$25; a total of \$275, leaving a net profit of \$175, a sum which every intensive cultivator may confidently expect to exceed, and yet which compares favorably with other branches of fruit growing.

Q.—What varieties give you the best results?

A.—If I had not planted any variety except the Williams during the past twelve years, my profits would have been on an average of \$1,200 per year greater than they have been.

Q.—You stated that your practice is to have your rows 3 feet apart and 15 in. apart in the row.

A.—Yes, about 3 ft. or 3 ft. 3 in. for weak varieties; for others 3 1-2 ft.

Q.—We find that with 3 ft. rows the plants entirely cover the ground by fall and we cannot continue cultivation.

A.—You should not let your row get that wide. We cut off the runners by cultivating between the rows. Wide rows exhaust the moisture in the soil, and the pickers destroy the plants and fruit when the rows are too wide. A width of about 1 ft. is very satisfactory, or it may be made 15 in. We do not cut off the surplus runners but keep them down by cultivation close to the original plants.

Q.—Would not that throw them into the row and make your row unduly thick?

A.—We try to avoid that by allowing sufficient distance between the plants when we set them out in the spring.

Q.—Did you ever practise cultivating both ways for a time?

A.—Personally I have never done so, but some of the growers do it.

Q.—I practised that method this year with much satisfaction and saved a great deal of expense of hoeing.

A.—We put our plants a little closer together on account of our soil. We do not get as rapid growth on lighter soil.

Q.—How do you handle your beds after picking so as to prepare for the second year?

A.—I regard it as very important that, just as soon after packing as you can attend to it, the patch should be cleaned up. Narrow the rows down pretty thoroughly either with a plow or a cultivator, and work up the ground well between the rows.

Q.—Are you in favor of mowing and burning the plants after the first crop?

A.—I cannot say that I would personally recommend it. Situated as we are where we can get labor, I prefer to hoe them. We have our plants cultivated by the people who do the picking. We can get Indian pickers

from the Grand River Reservation, and when there is no picking to do, they are ready to do the hoeing. We take them on in the spring and keep them through the season, helping us with all our fruits.

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## REPORTS FROM SHIPPING ASSOCIATIONS.

### BURLINGTON ASSOCIATION.

A. W. PEART: We have a good co-operative shipping system which has been in existence for 20 years. I can bear out the testimony of Mr. McNeill as to the efficiency of the service now rendered by the transportation companies. We are getting a good service to Montreal, and only once have we failed in connecting with the boats when we have given the car two days and three nights in which to do it. With us pears are as important as apples for export trade. Our Bartlett pears arrived too green this season, but sold at a fair price. Clapp's pears surprised us by outselling the Bartlett. The Duchess is the only pear that has outsold Clapp's.

### FOREST ASSOCIATION.

A. LAWRIE, Secretary: Our Association has been in existence for about three years, and during that time we have made considerable progress both in the cultivation of our orchards and the production of a good quality of fruit, and also in the shipping of the product to the North-West and the Old Country. We have aimed to get a membership of fruit growers that will take care of their orchards. In this way we secure a quality of fruit that commands a ready sale in the market. This year we have consigned our fruit for the most part to the Old Country, and some returns from our shipments are already to hand. Our first shipments, consisting mainly of Fall Pippins, Ribston Pippins, and Maiden's Blush, netted us \$2 for firsts and seconds. Our later shipments we have not definitely heard from as yet. We still have a considerable amount of our product on hand. Our membership this year is about thirty, and an increasing interest is being taken by the members in the care and culture of their orchards.

### NEWCASTLE ASSOCIATION.

W. H. GIBSON, President: This is our first season and we have a membership of only seven as yet. Our season has been successful financially, and we took the somewhat unusual course of selling our fruit to a dealer. We did so for the reason that the dealer, who was constructing a cold storage building, made an agreement with us, whereby we were to give him our apples, the price arranged for being \$2.25. Some of our neighbors who did not belong to the Association did not receive nearly as much. One of our rules was that each member must spray his orchard a certain number of times, and when we came to gather the crop we found that the fruit had been greatly benefited thereby. Where the orchards were thoroughly sprayed, there was not two per cent. of wormy apples, while neighboring orchards had 50 per cent. In one orchard I counted 154 apples on a tree, one-half of which were wormy, and on the ground I counted 170 that had dropped from the same reason. In the Association orchards very few apples had dropped during the season.

Q.—What mixture did you use?

A.—Bordeaux and Paris Green, from six to seven ounces of the latter.



The apples we grow are of the late winter varieties, mostly Stark, Ben Davis, Baldwin, Spy and Russet, apples which to get the best market should be held till late winter or spring. A large number of orchards are being planted in our section and people are very enthusiastic over winter apple growing.

Mr. G. C. CASTON, Craighurst: Speaking about spraying, I should like to ask whether anyone here has used Swift's arsenate of lead instead of Paris Green for codling moth. One disadvantage of Paris Green is that it is washed off by rain, and does not remain in sufficient quantities to be always effective. It is claimed for arsenate of lead that it will cling to the tree like glue. It is also claimed that it will not burn the foliage if it is used separately, and it is not necessary to use lime. I should like to hear the experience of growers on this subject.

Mr. WALLBRIDGE, Belleville: I have been troubled with codling moth in my orchard, and Paris Green did not seem to have much effect. I used arsenate of lead for the first time this season. I gave three applications, all being made after the blossoms dropped, and I did not have more than five per cent. of wormy apples. After the trees have been sprayed the leaves seem to show the mixture for some time afterwards, notwithstanding rain. I use three pounds to the barrel, and it costs fifteen cents per pound by the fifty pound keg. I have used it with Bordeaux mixture and also alone.

Q.—Did you use the same quantity when mixed with Bordeaux?

A.—Yes. For the first application I used three pounds to the barrel, for the second two pounds, and for the third one pound.

Secretary HODGETTS: In our power spraying demonstrations we used it at Meaford and had very good success with it, using it along side of Paris Green. It held up better in the Bordeaux mixture and stuck better to the fruit, but we did not see much difference in the results.

Mr. DEMPSEY, Trenton: I used it this year and could see no difference between it and Paris Green. I found that it gave better results with potatoes than Paris Green.

#### OSHAWA PACKERS' ASSOCIATION.

ELMER LICK, Sec.: The first object aimed at by our Association was to obtain for the growers what might be considered a reasonable price for their apples. This year on the borders of Pickering Township we had a good opportunity to compare the results obtained by our method of handling and shipping with the customary mode of disposing of the apple crop in the case of two adjacent orchards. One was sold to the buyer at less than fifty cents a barrel for the packed apples; while in the other orchard, which was not composed of such desirable varieties, the grower will net anywhere from \$1.30 to \$1.70 a barrel for the apples, packed and delivered. This year we have taken fruit from 28 to 30 orchards, comprising 4,800 to 5,000 barrels. So far we have shipped 900 barrels and there will be scarcely any difference between returns received and the price we asked, and we asked a pretty high price for our choice fruit. We have had a little difficulty this year with some of our growers picking their fruit before it was ready. Another difficulty has been the persistent efforts of dealers to buy apples from men in our organization. One dealer made an indefinite offer to one of our members, putting it in this way: "Would you take \$600 for the fruit of your orchard?" We shall succeed in getting him a little more than that for his crop. We take care to pack our fruit as carefully and as quickly as possible. We endeavor with fall varieties to pack within forty-eight hours of the time the fruit comes from the grower.

## ST. CATHARINES COLD STORAGE AND FORWARDING ASSOCIATION.

ROBT. THOMPSON, Pres.: Our company shipped 160 cars during the season, about 60 of them being sold f.o.b. at our station. 64 cars netted a little over \$30,000. The majority of the cars we sold to commission men, who expressed satisfaction with this system of buying. Our Association bought 250,000 baskets wholesale, and thus we were fortunate in avoiding the basket famine which afterwards came about. Our spraying materials and supplies were all bought in this way. We obtained one car of boxes from British Columbia for tomatoes, peaches and apples. We like these boxes better than those made here. Not only have they a better appearance, but they hold the nails far better.

## SIMCOE ASSOCIATION.

Although this is our first year, and we had the usual difficulty in getting the farmers to co-operate, we have a membership of about twenty. We accepted no one as a member who would not spray at least four times. Our experience is that unless our orchards are thoroughly cultivated and sprayed, a good quality of fruit cannot be produced. Many who refused to join our Association last spring are now very sorry, because they are out of pocket by not doing so. We intend erecting a storehouse and also an evaporator in Simcoe to utilize the waste products of our orchards.

## TRENTON ASSOCIATION.

W. H. DEMPSEY, Trenton: Our organization is scarcely on a running basis as yet, although we have handled considerable fruit this year. Probably 3,000 barrels of early apples have been shipped to the Old Country and brought very good prices, one consignment bringing \$2.55 net. Our winter varieties are in storage at the present time ready for sale or export. It has been very gratifying to the Association to learn from the members that many of them have received so far for their early apples as much as they got for their whole crop in past seasons. We have not made any stringent rules about spraying as yet. Those who do not take care of their orchards will certainly see where they stand, and we have no doubt they will be induced to spray as a result.

## BELLEVILLE ASSOCIATION.

F. S. WALLBRIDGE: This year we made two consignments of early fruit and obtained from \$1.75 to \$2 a barrel. We put our other apples in cold storage, and have on hand from 1,500 to 1,800 barrels of Ben Davis, Golden Russet, etc. We prefer to sell our fruit as a rule rather than consign it.

## ARKONA ASSOCIATION.

We have had great success since our Association was formed by Mr. Sherrington two years ago. The first year we had a membership of eight and shipped only one carload of apples. This year we shipped seven carloads and our returns have been very satisfactory. Early in the season the Department of Agriculture conducted a demonstration in power spraying in our neighborhood, with the result that many are starting to spray their trees.

MR. A. B. CUTTING: Many of you are doubtless aware that a Provincial



association has been formed, known as the Ontario Co-operative Fruit Growers' Association, although its name will have to be changed, as it conflicts with the name of this organization. This is a co-operative movement among the co-operative associations. It is purely commercial in its object and design, and is intended to be a medium through which the local associations may secure reliable information as regards crop prospects, conditions and prices, not only in Ontario, but all over Canada and as far as possible in other countries. The organization will also endeavor to promote better methods of orchard handling, and the formation of local co-operative associations, where these do not exist at the present time.

Mr. G. C. CASTON, Craighurst: I desire to take this opportunity of uttering a warning in reference to the fruit trade. I am credibly informed that a certain amount of trash is still being shipped to the North-West from Ontario. The people there are paying as much for it as should secure them good apples. This sort of thing is bound to injure the business and also our reputation with the people there. I am also informed that a great number of apples are being shipped into the Algoma District without bearing any stencil marks on the package. This is a matter to which the attention of the Department at Ottawa should be drawn.

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#### VOTE OF THANKS.

On the motion of Mr. W. H. BUNTING, seconded by Mr. G. C. CASTON, it was resolved that:

The Association desires to express its appreciation to His Worship, the Mayor, and the Board of Control of the City of Toronto, for so generously granting the Association the use of the rooms in which its sessions have been held.

It was moved by Mr. THOMPSON, seconded by Mr. STEPHENS, and resolved that the thanks of the Association be tendered to the directors who are retiring owing to the provisions of the new constitution, for what they have done on behalf of the Association in the past, and to express the hope that, should the future demand it, they will ever be found ready to once more assume the duties of the office.

The President: On behalf of the retiring Board of Directors I can assure you that we appreciate very much the spirit of the resolution you have been good enough to pass. I wish to thank all who have attended our meetings for the deep interest taken in the affairs of the Association. I have been very much gratified at the large attendance, and consider that this has been one of the most successful meetings I have had the pleasure of attending.

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# APPENDIX "A."

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## REPORT OF THE HISTORICAL COMMITTEE.

By LINUS WOOLVERTON, CHAIRMAN, GRIMSBY.

### *Preface.*

The Ontario Fruit Growers' Association has accomplished so much for the advancement of the industry during the last forty years, that much honor is due to those who organized it and to those who afterward gave their time and talents to the direction of its affairs.

The first president was Judge Campbell, of Niagara, who was elected at the organization meeting held in the Mechanics' Hall, in Hamilton, in January, 1859. This meeting was called at his suggestion, in conference with D. W. Beadle, of St. Catharines, and Mr. George Leslie, sr., of Toronto. There were only eighteen persons present at this first meeting, only one of whom is still living, viz., Mr. A. M. Smith, of Port Dalhousie. In January, 1861, the second annual meeting was held, at which Judge Logie, of Hamilton, was appointed President, and D. W. Beadle, Treasurer. It was soon found best to unite the office of secretary and treasurer, and the two were combined and given to Mr. Beadle, of St. Catharines, who served the Association with distinguished ability until the year 1886, a period of twenty-five years. He was then succeeded by Mr. Linus Woolverton, of Grimsby, who held the position of Secretary-Treasurer, and Editor of *The Canadian Horticulturist* until the year 1902, a period of sixteen years. The work then requiring division, Mr. G. C. Creelman, of Toronto, was made Secretary-Treasurer, and held the position until 1904, when he was appointed President of the Ontario Agricultural College, and gave place to Mr. P. W. Hodgetts, the present Secretary.

While the office of secretary was held continuously by two or three successive persons, that of president has been filled by a long list of worthy gentlemen, who have given direction to the affairs and dignity to the meetings.

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### CHARLES ARNOLD.

A native of Bedfordshire, England, where he was born in the year 1818, Mr. Arnold removed to Paris, Ontario, in 1833, and twenty years after established the Paris Nurseries. Always busy in the interests of scientific horticulture, he was chosen a director of the Ontario Fruit Growers' Association at its very commencement, a position he held to the day of his death. He was an enthusiastic hybridist, as the many varieties of grapes, apples, raspberries, etc., originated by him, bear witness. In 1872 he obtained a gold medal at the Hamilton Fair, for a new and valuable variety of white wheat; but the most fortunate of his productions in this direction was the American Wonder Pea, for which he received from Messrs. Bliss & Sons, of New York, the handsome sum of \$2,000.



The last meeting of our Association, at which Mr. Arnold was present, was in January, 1883, and he was accompanied by Mrs. Arnold. It was on this occasion that he read to us a poem of his own, entitled "A Seat on the Hill-top beneath the old Tree," of which the second stanza runs thus:—

How can I but love thee, thou sacred spot?  
And think of the loved ones who were, but are not,  
When I view thine old trunk draped o'er with the vine,  
The Wood-vine and Pipe-vine thy branches entwine;  
And could but those dear ones who planted them there  
Sit again by my side these blessings to share;  
There's nought in this wide world I'd barter for thee,  
My seat on the hill top beneath the old tree.

At the summer meeting following, it was our sad duty to pass a resolution regretting his loss, as that of one who "during his long life labored with great industry to advance the interests of fruit culture in this country, and by his efforts to improve our fruits and grains by cross fertilization, and has, while benefiting his own province, gained a world-wide reputation."

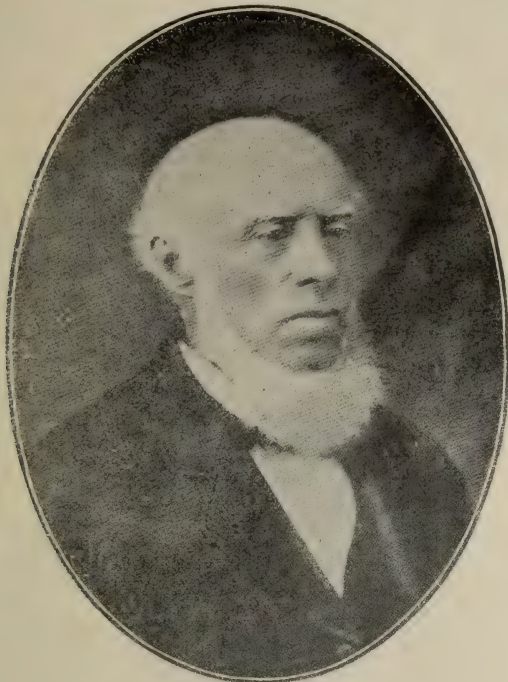
The following valuable notes on Mr. Arnold's labors as a horticulturist, have been contributed by D. W. Beadle, who as Secretary of the Association, had full cognizance of all his work in this direction:—

"Mr. Charles Arnold was, I believe, the pioneer in experimenting in the line of cross fertilization, with the view of producing new varieties of fruits in Canada. His first attempts, as far as is known, were made with the grape. In his first experiments he took for the mother plant a wild vine of, if I mistake not, the *Aestivalis* family, and impregnated the flowers with pollen of the *Vinifera* tribe. From the seed thus produced he raised a number of seedlings, some of which seemed to be well worthy of cultivation, which he named Othello, Cornucopia, Autuchon, Brant and Canada. These are fully described in the Bushberg Catalogue of 1883, from which we learn that they were much esteemed in many parts of France. However, they do not seem to have been well adapted to the climate of America, being too subject to mildew and rot. The raspberry received attention from Mr. Arnold, and he raised quite a number of crosses between the Antwerp tribe and a White Cap. None of these proved to be of permanent value, exhibiting often a great tendency to sport back to the original Antwerp. His crosses of the apple have been of more value to us, and one of them, the Ontario, is being grown successfully in many parts of this Province.

Mr. Arnold gave also considerable attention to cross-breeding of wheat, and produced several varieties of that cereal. Whether any of these have proved to be of special value, I am not informed. His greatest success was in the production of cross-bred peas. By crossing the Champion of England with Tom Thumb, he produced a pea having the rich flavor of the Champion of England, and the dwarf habit of the Tom Thumb. This pea has been widely disseminated as the American Wonder, and is yet to be found in some of the seed catalogues.

The above is a brief account of Mr. Arnold's labors in cross-fertilization. He led the way, others have followed; among them the late Mr. W. H. Mills, of Hamilton, and Wm. Saunders, now Director of the Dominion Experimental Farms. Mr. Mills confined his labors to the grape; but Mr. Saunders took in the whole field of fruits in his experiments.

Mr. Arnold thought several of his cross-bred apples worthy of a name, among them being Arnold's Beauty, Ella, Dora, and already mentioned, Ontario."



CHARLES ARNOLD.

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DELOS W. BEADLE, B.A., LL.B.

17 October, 1823—30 August, 1905.

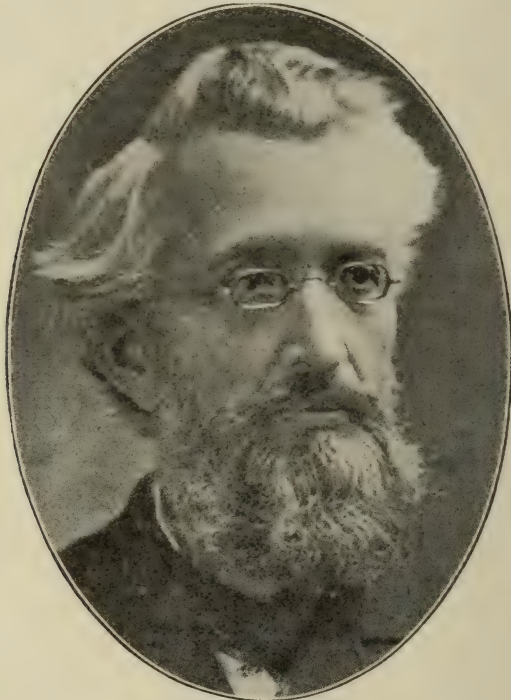
During the year 1905 there passed quietly away in the city of Toronto one of two then living constitutional members of the Ontario Fruit Growers' Association, in the person of Mr. Delos W. Beadle. To this gentleman in no small degree, is due the early progress and development of the fruit growing interests of this Province, and some lasting tribute to his ory is justly due from this Society.

Mr. Delos W. Beadle inherited a taste for horticulture from his father, Dr. Beadle of St. Catharines, who was one of our earliest Canadian nurserymen. He was born in that place on October 17, 1823, and was prepared for college at the Grantham Academy, now the St. Catharines Collegiate Institute. In September, 1841, he entered the sophomore class in Yale College, New Haven, Conn., where he obtained his B.A. degree in July, 1844, and two years later he received his B.A. (*ad eundem*) from the University of Toronto. In 1847 he received his LL.B. degree from Harvard University, Cambridge, Mass., and in 1848 he was called to the bar in New York City, where he practiced law for about 6 years. His failing health made it necessary for him to seek an outdoor life. He accepted from his father an interest in the nursery business, in which line he continued until his retirement in 1887.

When the Hon. George Brown began the publication of the Canadian Farmer, Mr. Beadle undertook the charge of the horticultural department and continued to edit it for several years.



In January, 1859, the Fruit Growers' Association of Upper Canada was organized in the City of Hamilton with 18 members. Judge Campbell was the first president, and Arthur Harding, the first recording secretary. On the 16th of January, 1861, Judge Logie of Hamilton, was elected president and D. W. Beadle, secretary, a position which he filled for twenty years with such distinguished ability, that his statements on matters horticultural were everywhere in Canada looked upon as authoritative and reliable. Dr. William Saunders in his annual address, as president in 1884, says of him: "While I acknowledge with pleasure the valuable aid rendered by my much esteemed predecessors in the presidential chair, the lamented Logie, W. H. Mills, Dr. Burnet, and P. C. Dempsey, and esteem it an honor to wear their mantle, I feel free to say with no fear of contradiction, that the Fruit Growers' Association owes its present high position and influence more to its able secretary than to any other man belonging either to the past or to the present."



D. W. BEADLE.

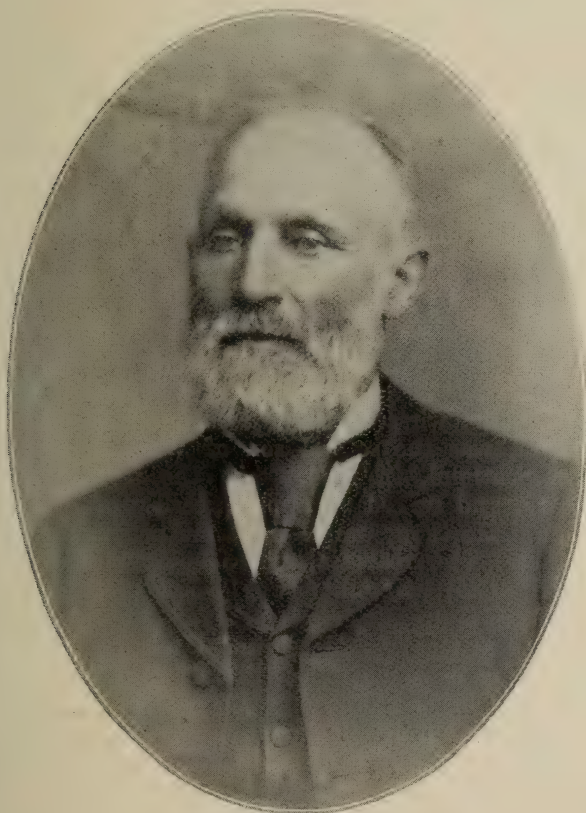
At the suggestion of Mr. Beadle, the publication of the Canadian Horticulturist was undertaken in January, 1878, by our Association. His idea was that such a publication would serve to hold together the membership by affording a means of constant intercommunication of ideas, suggestions and experiences in horticulture throughout the round year. As an evidence that Mr. Beadle's abilities were recognized abroad, we may add that on the 10th of November, 1862, he was elected corresponding member of the Horticultural Society of London, England.

In the year 1887, Mr. Beadle sold out his nursery business in St. Catharines to the D. W. Beadle Nursery Company. At the same time he resigned as secretary of the Ontario Fruit Growers' Association and editor of the "Canadian Horticulturist." His most valuable book, "The Canadian

Fruit, Flower and Kitchen Gardener," was dedicated to the President and members of the Ontario Fruit Growers' Association. The rest of his life he spent in Toronto, a student of nature and botanical research until his lamented death, the 30th of August, 1905.

### PETER C. DEMPSEY.

More than a hundred years ago Mr. Dempsey's grandfather, a United Empire Loyalist, settled at Albury, Prince Edward County. Fond of fruit culture, he brought seeds along with him, from which he started a nursery,



P. C. DEMPSEY.

principally of apple trees, some of which are still living and bearing fruit upon the old homestead. Cider was made in large quantities from this orchard in early days, and during the war of 1812 proved a very profitable business, bringing him high prices by the hogshead.

Thus, growing up among orchard trees, Mr. P. C. Dempsey early developed a taste for fruit culture, and in the year 1857, finding the confinement of office work too great for his failing health, he decided to devote his whole attention to horticulture.



Soon after, hearing of the good work being accomplished by the Fruit Growers' Association, he became a member, and was first elected a director in the year 1873. A fluent and pleasing speaker, he was always heard with interest by all in attendance, and honored by his election, in the year 1875, to the position of Vice-President; and in 1880, and again in 1881, to the highest gift in the power of the Society to bestow, viz., that of president.

Mr. Dempsey was sent to the Centennial Exhibition, in company with Colonel McGill, of Oshawa, in charge of our exhibit of Canadian fruit, the medals from which are still in possession of our Association; and in 1886 he was employed by the Dominion Government, in company with Mr. A. McD. Allan, to have charge of Canada's fruit exhibit at the Colonial and Indian Exhibition.

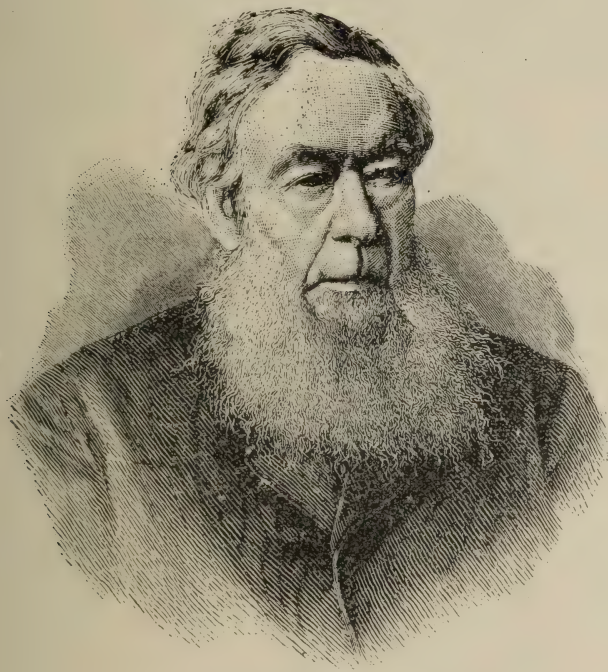
Mr. Dempsey's name is deserving of special notice in historic records for his devotion to the art of producing new varieties of fruits by hybridization. This subject was a favorite study with him, and he was successful in giving to us several interesting and valuable fruits; as for example, the Burnet grape, the Trenton apple, the Dempsey pear, and the Dempsey potato. The Dempsey pear is a cross between the Bartlett and the Duchess, partaking of the excellencies of both, and is later in season than the Bartlett. The Trenton apple is a cross between the Golden Russet and the Northern Spy. It has somewhat the appearance of the Fameuse family, but is larger and the color a deeper crimson.

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#### GEORGE LESLIE.

Mr. George Leslie, whose name is associated with the earliest meetings of our Association, was the second son of Wm. Leslie. He was born in Sutherlandshire, Scotland, in 1804. At the age of sixteen he went to Tarlogie, Rosshire, and served an apprenticeship of three years in the gardening profession. He then, under the same proprietor, took charge of the garden, hedges, etc., at Arrabella, where he remained two years. On the first day of April, 1825, being his twenty-first birth day, he with his parents and six brothers and a sister, set sail for America, and after a passage of six weeks landed at Quebec. He immediately obtained employment. In the October following he came to Little York, now Toronto. At that time there were only five brick stores on King Street, all situated east of the market. He at once went to Streetsville, whither his father had preceded him, and chopped in the bush all winter. In the spring he returned to Toronto and entered the service of the late Hon. George Crookshanks, Commissary General. He remained with him one season, and then for several years acted in the capacity of gardener and florist for the late Hon. Wm. Allan, father of the Hon. Geo. W. Allan; the late Hon. John Henry Dunne, Receiver-General; the late Chief Justice Sir Wm. Campbell; the late Bishop Strachan, and others. In 1830 he purchased, from the Rev. Jas. Beatty, the old homestead at Streetsville, previously occupied by his father, a portion of which he cleared and improved. In 1837 he located permanently in Toronto, leasing Russel Abbey Square, bounded by Caroline, now Sherbourne, King, Princess and Front Streets, with all the buildings thereon, using the ground for the growing of shrubs, flowers, vegetables, etc. He soon after established himself in business as a grocer and seed merchant. His first stock of seeds was brought from London England. In 1838 the

Gas Company erected their works just south of the premises occupied by him, and his store was the first building in the city lighted with gas, crowds coming to view the new illuminant. He subsequently transferred his business to Yonge Street upon the present site of the Bank of Commerce, where he remained until 1845, when the city purchased the property for the purpose of opening up Colborne Street, paying him the sum of \$5,000 in corporation debentures. He then leased twenty acres east of the Don river for a period of 21 years, where he began business as a nurseryman, florist and gardener. He subsequently purchased this and adjoining properties to meet the requirements of his business, which increased most rapidly. He was an active member of horticultural and agricultural societies



GEORGE LESLIE.

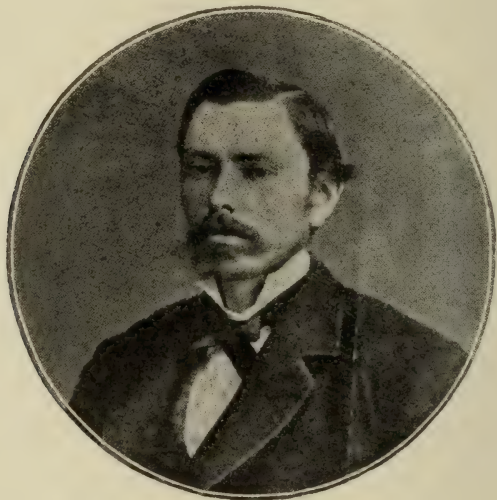
for many years, and a life member and director of the Horticultural Society and Botanical Gardens of Toronto. During the 43 years that he was established in business he was awarded at exhibitions many gold, silver and bronze medals, a large number of diplomas and hundreds of other prizes for superiority of productions. In the year 1880 a special silver medal was presented to him by the Agricultural and Arts Association of Ontario. The inscription thereon reads: "To Geo. Leslie, sr., in grateful acknowledgement for his horticultural efforts, by the Council of Agriculture and Arts Association of Ontario." When the first fire company was formed in York he became a member. In 1853 he was commissioned a magistrate by the Hon. Robert Baldwin, the duties of which office he discharged with fidelity. He filled the office of school trustee for nine years and was for one year alderman for the city, but did not seek re-election, not being inclined to neglect his business to engage in political strife.



## CHARLES GIBB.

At our summer meeting at Picton, Ontario, in 1888 we had with us a friend of Canadian horticultural who deserves an exalted place in our roll of the fathers of Canadian horticulture. Little did we think, as we climbed the white sand cliffs of Prince Edward County, in his company, that we should soon after hear the sad news of his passing.

Mr. Charles Gibb was born at Montreal on the 30th of June, 1846. He received his early education at Bishop's College, Lennoxville, and went from there to McGill College, Montreal, where he graduated B.A., at the age of nineteen. The application necessary to complete a college course successfully at so early an age, not only injured his eyesight, but also much impaired his health, and he was told by physicians that he had only a few



CHARLES GIBB.

years, perhaps only a few months to live, and they advised him to seek recuperation in foreign travel. This he did, going abroad in company with his uncle, Mr. J. J. Gibb, of Como. This first trip was of two or three years' duration, and embraced visits to Egypt, the Holy Land, and afterwards Switzerland and Europe generally.

On his return he engaged in the cultivation of fruit, in the State of Pennsylvania, no doubt because he rightly considered it one of the most healthful, as well as one of the most interesting departments of agriculture. The climate of Pennsylvania not agreeing with him, he returned to Canada, and purchased the farm on the slope of the Yamaska mountain, at Abbotsford, so well known to us all of late years, on account of the interesting experiments with Russian and other hardy fruits which he has carried out there.

In 1873 he made repeated trips to the United States, studying the pomology of that country, bringing everything worthy of trial to his farm, not merely in sufficient quantities to stock his own farm, but also enough to make free distributions of trees and plants to his neighbors.

In 1882 Mr. Gibb, in company with Prof. Budd of the Iowa Agricultural College, went to Russia in quest of the most hardy fruits which might be expected to endure the extremes of temperature to which the northern parts of Canada and the United States are subject. Prof. Budd had already made a large collection of hardy fruits at Ames, but so little was definitely known of the names and values of the various Russian fruits that it seemed necessary that some one should go to Russia charged with this errand. Speaking of it afterward Mr. Gibb, with his characteristic modesty, said: "Northern horticulturists were looking with great hopes to Russian fruits. The work could not be allowed to rest. Some one must go to Russia; Mr. Budd and I went." On pages 192-230 of our report for 1883, may be seen a full report of this journey, written by Mr. Gibb, who, it is well worth noting, took this costly journey at his own expense. This trip was followed by importations of trees and seeds which were distributed to the members of the different Fruit Growers' Associations of the Province of Quebec, and seeds of which were sent to the Experimental Farm, Ottawa, and to the Botanic Garden at Montreal.

In 1887 he went alone over the same ground, to verify his previous work; visiting in addition, Norway, Sweden and Denmark. Other trips were made in the interests of horticulture to the North-West, British Columbia, California, etc., and in July, 1899, he left for another trip around the world, taking in especially Japan, China, India, and other countries.

Freighted with much valuable information, he was on his way home when his death occurred on the 8th of March following, in Egypt. He contracted la grippe at Aden, which developed into double pneumonia. His remains were interred in the British Protestant Cemetery at Cairo, on the 10th, the funeral being attended by several friends. It was in accordance with his extreme modesty, by which he was especially characterized in life, that he made the request that his funeral would be conducted in a plain unostentatious manner.

Mr. Gibb's mind was very receptive, his opportunities great, and his memory retentive, so that he was generally looked upon as a bureau of information, which he was always glad to impart, and in consequence his correspondence was very heavy. Since it was so fully in accord with the experimental work in which he had already been engaged at Abbotsford, it is not surprising that he was one of the first and most active workers in the establishment of the Central Experimental Farm, in connection with Prof. Saunders.

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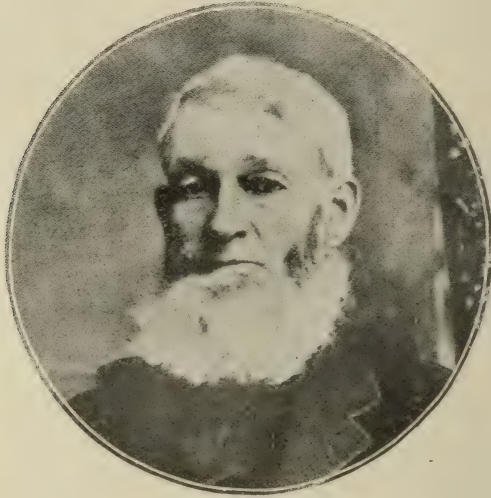
### JOHN CROIL.

For thirteen years director of our Association for Division No. 1, and most faithful in his attendance and duties, Mr. John Croil deserves a place on our historical records.

He was a native of Glasgow, Scotland, where he was born in the year 1824. He received a good classical education at the Grange Academy, Sunderland, England, and at the age of nineteen came to Montreal, where for four years he engaged in mercantile life; but finding the close confinement unfavorable to his health, he decided upon a country life, and purchased a farm in Osnabruck, situated on the banks of the St. Lawrence, and



built himself a home which he appropriately named "Sunnyside." Here he planted six acres of an orchard, largely of the Fameuse, which became noted as one of the finest in the section, and this, with his garden, gradually engrossed his attention, until of late years. His chief delight was in the pursuit of horticulture. He was a director of our Association from the year 1877 to the year 1890, during which time he has worked faithfully in the



JOHN CROIL.

interest of our department of industry. His frequent and spicy contributions to our journal and to our reports are a proof of this statement. Only a short time before his decease, he agreed to give a paper at our Summer Meeting on the "Use of Artificial Fertilizers in the Garden;" but on the 26th of June his work in his terrestrial garden ceased, and he was called to take his place among the flowers and fruits of the Celestial garden.

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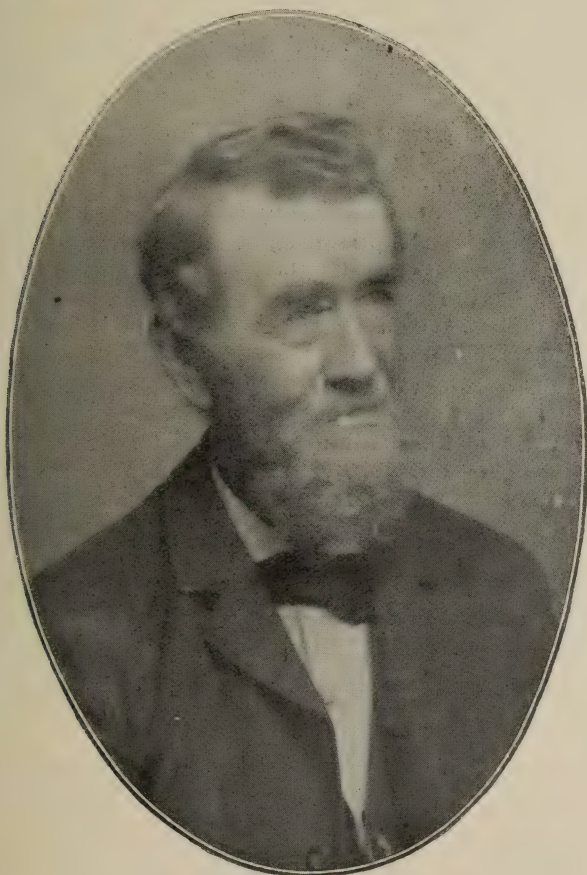
#### CHARLES EDWARD WOOLVERTON.

One of the eighteen constituent members of our Association, present at the organization in the City of Hamilton, was Mr. Charles E. Woolverton, of Grimsby, Ont. He was born at Grimsby, Ontario, in August, 1820. His father Dennis Woolverton, who farmed about four hundred acres of land, was at one time M.P.P., for the County of Lincoln, and well known as one of the early settlers in the Niagara District. On this farm there was an apple orchard in 1798. When Jonathan Woolverton, Charles' grandfather purchased it, it was of natural stock, and was top grafted about 1828 by an English gardener. I have often heard my father speak of him as "Old Peasley," and that he was a Quaker, and wore a big leathern apron, in the pockets of which he carried his scions.

Among my grandfather's papers, I have found a record of the varieties in his own handwriting, and they were as follows:—

Early French Russet.  
Early Harvest (from Queenston).  
Rhode Island Yellow Sweet.  
Col. Howard's September Sweet.  
Pumpkin Sweet.  
Pie apple.  
Sweet Bellybound.  
Large Greening.  
Ribston (from England).  
Rhode Island Greening.

Snow.  
Spitzenberg.  
Swayzie Pomme Grise.  
Orange Pippin.  
Farmers' Long Keeping.  
Newton Pippin.  
Blue Pearmain.  
Crook's Large Sweet.  
Holland Pippin.  
Large Pippin.



C. E. WOOLVERTON.

Some of these trees are still standing on the old farm, which I have the honor to occupy. One of them, a Greening, now occupies an area of nearly 40 square feet, and in one favorable season, I remember my father, Charles, picking twenty barrels of beautiful apples. He always used a grain bag for apple-picking, tied at the corners, and hung over the shoulder.



From a boy, therefore, Charles was made familiar with the occupations of the farm and the orchard. Often, in his boyhood days, before there was any G. T. R. or C. P. R., he was sent to Hamilton market, a distance of some sixteen miles with wagonloads of peaches or apples, but there was no such thing as an export of fruit, and Hamilton market was frequently glutted.

Charles was given a liberal education at Madison University, in New York State, but his two brothers having taken to the medical profession, he was induced to come home and be the farmer.

About the year 1857, he entered into the nursery business at Grimsby with A.M. Smith, under the title of Woolverton & Smith, and for about fifteen years a large local business was done in all kinds of fruit trees; after which the partnership was dissolved, and the business came into the hands of his son, Linus.

In those early years, Charles was a regular attendant upon the meetings of our Association, held at Hamilton. Of the names of men associated with him, at that time, some idea can be gained from the following extract from one of his magazine articles:—

“When our Association met at St. Catharines we were twice surprised; first at the knowledge of Judge Campbell and Delos Beadle about fruit, climate and soil; and second, at our own ignorance of the fruit we had been handling for a term of years. The genesis of our Association budded in St. Catharines. Judge Campbell was the first life member, but he did not live to see it bloom. Delos Beadle was the Moses of our exodus, leading us out of ignorance into our present fruit bearing stage. The formal organization of our Association elected W. H. Mills, of Hamilton, as President. He was not one of the mills of which it takes ten to make one cent, nor was he a wind-mill to crack corn, but he honored the goddess Pomona, by cultivating fruit and flowers, and at one of our meetings he took us out to see how he raised the finest plums and pears by the sweat of his brow.” In this article he refers also to Arnold, Holton, Haskins, Burnet, Saunders, Logie and others. He passed away in September, 1900, at the age of eighty, after an honored and useful life.

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# APPENDIX "B."

## CONSTITUTION AND BY-LAWS.

### REVISED CONSTITUTION AND BY-LAWS OF THE FRUIT GROWERS' ASSOCIATION OF ONTARIO.

#### PREAMBLE.

The objects of the Fruit Growers' Association of Ontario shall be the advancement of the science and art of horticulture in all its branches.

- (a) By holding an Annual Convention for the consideration of questions relating thereto.
- (b) By co-operating in every possible way with district and local fruit growers' associations and horticultural societies hereinafter mentioned.
- (c) By collecting, arranging and disseminating useful information.
- (d) By co-operating with the Ontario Department of Agriculture in all matters pertaining to the advancement of horticulture.
- (e) By holding an annual exhibition of fruit and other horticultural products and awarding premiums in connection with the same.
- (f) And by such other means as may from time to time seem desirable.

#### NAME.

1. This Association shall be called the Fruit Growers' Association of Ontario, and hereafter in this Constitution shall be referred to as the Ontario Association.

#### MEMBERSHIP.

2. Any person interested in horticulture may become a member by payment of one dollar per annum in advance to the general secretary, or by paying the necessary fee to the secretary of any district or local association in affiliation with the Ontario Association. A single payment of \$10.00 to the general secretary shall constitute a member for life.

3. Members of the Ontario Association in good standing shall be entitled to receive regularly the official organ of the Association, a copy of the Annual Report, such other literature as may be sent out by the Association from time to time and any other privileges that may be provided or arranged for by the Association.

4. The Association financial year shall end on the 31st of December.

#### ANNUAL MEETING.

5. The Annual Meeting shall be held at such time and place as may be designated by the Ontario Association.

#### OFFICERS.

6. A President, Vice President, Secretary-Treasurer and Directors only shall be the duly qualified officers of the Ontario Association.

7. The Directors shall be elected by ballot at the morning session of the last day of the Annual Meeting, and shall be thirteen in number, representing the thirteen Agricultural Divisions as set forth in Schedule A of this Constitution. The newly elected Board of Directors shall not take office till the second Tuesday in January of the year following, when the report of the retiring Executive and the Treasurer shall be received. Those four Directors who have occupied positions on the Board of Directors for the longest period shall not be eligible for re-election. These Directors shall, however, be eligible for re-election at the end of one year.

8. The newly elected Directors shall at their first meeting appoint from among their number a President and a Vice-President, and also from among themselves or otherwise, a Secretary-Treasurer.



9. The President, Vice President, Secretary-Treasurer and two other members appointed by the Directors shall constitute the Executive Committee of the Ontario Association.

#### DUTIES OF OFFICERS.

10. It shall be the duty of the President to preside at all meetings of the Ontario Association, decide all questions of order, and make any suggestions he may deem necessary in the interests of the Association. He shall be, *ex-officio*, a member of all committees appointed.

11. In the absence of the President, the powers and duties of his office shall devolve upon the Vice President.

12. It shall be the duty of the Secretary-Treasurer to attend all meetings of the Ontario Association, the officers and the Executive, and keep correct minutes of the same; conduct all correspondence and issue all press and other reports; prepare the report of the Executive Committee for the Annual Meeting; forward the list of representatives to the Secretaries of Fair Associations, also prepare for publication the Annual Report. As Treasurer, he shall receive and account for all moneys belonging to the Association, pay such bills and accounts as have been approved by the Executive. He shall have the power of Managing Director acting under the control and with the approval of the Executive.

13. By virtue of his office he shall be a member of each committee appointed.

14. Before entering upon the duties of his office, he shall enter into a bond, with security when required, which shall be approved of by the Directors.

15. The accounts of the Ontario Association shall be audited by an expert auditor or accountant appointed by the Executive Committee, and approved by the Minister of Agriculture for Ontario.

16. At each Annual Meeting, the retiring executive officers shall present a full report of their proceedings to the Ontario Association. A detailed statement of the receipts and expenditures for the previous year, and of assets and liabilities, a list of members and such information on matters of special interest to this Association as the officers may have been able to obtain, shall be sent to the Minister of Agriculture for Ontario within forty days after the holding of such Annual Meeting.

17. The Executive Committee shall carry into effect the plan of work decided upon by the officers, and shall arrange the details of the same.

18. The officers, or the members of the Executive, or of any Committee may conduct by correspondence, the duties assigned to said officers, Executive or Committee, by the Constitution and By-laws, or by the Association, when such a course is deemed advisable by said officers, Executive or Committee.

19. In case a vacancy occurs in the officers or directorate, the Executive Committee may fill said vacancy forthwith.

#### COMMITTEES.

20. The Association may appoint such committees from time to time as may be deemed expedient, and the first person named thereon shall be declared chairman of each committee.

21.—(a) The actual and reasonable expenses of officers and members of committees when attending meetings in the interests of the Association shall be defrayed out of the funds of the Association.

(b) The railway fare only of the Directors in attending the Annual Meeting shall be paid by the Ontario Association.

#### NOTICE OF MEETING.

22.—(a) At least two weeks' notice shall be given of each annual and general meeting, naming time and place of meeting. Notice may be given through the public press and by circular letter mailed to each member.

(b) An officers' meeting shall be called by mailing at least ten days before date of meeting to each officer, a notice of meeting as above provided.

(c) Similar notice shall be given to each member of the Executive before an Executive meeting is held.

(d) An Executive meeting may be held on shorter notice, provided each officer is otherwise notified and consents thereto.

### QUORUM.

23.—(a) Not less than ten members shall be a quorum to transact business for the Association; not less than five members shall be a quorum at an officers' meeting; and not less than three members shall be a quorum at an Executive meeting.

(b) Any member of the Directorate or Executive not present at a meeting, if he send his views in writing, shall be considered as present.

### AFFILIATED ASSOCIATIONS.

24. Fruit Growers in any section of Ontario may form a local Association when it has a membership of ten or over, upon the payment to the Treasurer of the Ontario Association of \$5.00 for the first twenty-five members or fraction thereof above nine, and twenty-five cents per member for every additional member, which payment shall entitle the members to all the privileges and advantages of membership in the Ontario Association.

25. It shall be the duty of the officers and directors of the Ontario Association to encourage the formation of such local Associations.

26. Fruit Growers who are members of two or more local Associations shall be accepted as members of the Ontario Association from that affiliated Association only which is the first to forward the membership fee to the Secretary-Treasurer of the Ontario Association.

27. Such affiliated Associations may appoint one delegate to the Annual Meeting of the Ontario Association for the first twenty-five members or fraction thereof, and an additional delegate for every twenty-five members or major portion thereof above the first twenty-five. The actual railway fare of said delegate in attending the Annual Meeting shall be paid by the Ontario Association.

### CHANGE OF CONSTITUTION.

28. This constitution and by-laws may be amended by a majority of members present at an Annual Meeting or a special meeting called for the purpose of considering the same, and of which two weeks' notice shall be given.

### SCHEDULE A.—AGRICULTURAL DIVISIONS.

1. Stormont, Dundas, Glengarry, Prescott and Cornwall.
2. Lanark North, Lanark South, Renfrew North, Renfrew South, Carleton, Russell and the City of Ottawa.
3. Frontenac, City of Kingston, Leeds and Grenville North, Leeds South, Grenville South and Brockville.
4. Hastings East, Hastings North, Hastings West, Addington, Lennox and Prince Edward.
5. Durham East, Durham West, Northumberland East, Northumberland West, Peterborough East, Peterborough West, Victoria North (including Haliburton), and Victoria South.
6. York East, York North, York West, Ontario North, Ontario South, Peel, Cardwell, and the City of Toronto.
7. Wellington Centre, Wellington South, Wellington West, Waterloo North, Waterloo South, Wentworth North, Wentworth South, Dufferin, Halton, and City of Hamilton.
8. Lincoln, Niagara, Welland, Haldimand and Monck.
9. Elgin East, Elgin West, Brant North, Brant South, Oxford North, Oxford South, Norfolk North and Norfolk South.
10. Huron East, Huron South, Huron West, Bruce North, Bruce South, Grey East, Grey North and Grey South.
11. Perth North, Perth South, Middlesex East, Middlesex North, Middlesex West and the City of London.
12. Essex North, Essex South, Kent East, Kent West, Lambton East and Lambton West.
13. Algoma East, Algoma West, Simcoe East, Simcoe South, Simcoe West, Muskoka, Parry Sound East, Parry Sound West, Nipissing East, Nipissing West and Manitoulin.



# APPENDIX "C."

## FRUIT PRIZE LIST AT ONTARIO HORTICULTURAL EXHIBITION, 1906.

### APPLES.

#### CLASS 1. EXPORT OR FOREIGN MARKET VARIETIES.

##### (a) Barrels ready for Shipment.

- Baldwin:** 1st, Chatham F. G. A.; 2nd, Oakville F. G. A.; 3rd, Norfolk F. G. A., Simcoe.  
**Ben Davis:** 1st, Harry Dempsey, Rednerville; 2nd, Chatham F. G. A.; 3rd, Norfolk F. G. A.  
**Golden Russet:** 1st, Robert Thompson, St. Catharines; 2nd, Norfolk F. G. A.; 3rd, Belleville F. G. A.  
**Greening:** 1st, Chatham F. G. A.; 2nd, J. B. Guthrie, Dixie.  
**King:** 1st, Norfolk F. G. A.; 2nd, Oakville Fruit Growers'; 3rd, Belleville F. G. A.  
**Spy:** 1st, Chatham F. G. A.; 2nd, Norfolk F. G. A.; 3rd, Harry Dempsey.  
**Stark:** 1st, Harry Dempsey.

##### (b) Standard Boxes ready for Shipment. (Fruit Unwrapped).

- Baldwin:** 1st, Chatham F. G. A.; 2nd, Norfolk F. G. A.; 3rd, J. B. Guthrie.  
**Fameuse:** 1st, J. B. Guthrie; 2nd, Norfolk F. G. A.; 3rd, Harry Dempsey.  
**Golden Russet:** 1st, J. B. Guthrie; 2nd, W. G. Watson, Dixie; 3rd, J. G. Brown.  
**Greening, (Rhode Island):** 1st, Norfolk F. G. A.; 2nd, Chatham F. G. A.; 3rd, G. H. Carpenter, Fruitland.  
**King:** 1st, A. Riach, Bronte; 2nd, Bradford Bowlby, Port Dover; 3rd, Chatham F. G. A.  
**McIntosh:** 1st, Norfolk F. G. A.; 2nd, A. D. Harkness, Irenā; 3rd, B. T. Boies, Belleville.  
**Spy:** 1st, Chatham F. G. A.; 2nd, B. T. Boies; 3rd, Norfolk F. G. A.

##### (c) Standard Boxes ready for Shipment. (Fruit Wrapped).

- Fameuse:** 1st, Robert Thompson; 2nd, B. T. Boies; 3rd, W. H. Bunting, St. Catharines.  
**Gravenstein:** 1st, Chatham F. G. A.; 2nd, Robert Thompson; 3rd, Harry Dempsey.  
**King:** 1st, Biggs Fruit & Produce Co., Burlington; 2nd, B. T. Boies; 3rd, J. G. Brown.  
**McIntosh:** 1st, A. D. Harkness; 2nd, Frank Dempsey; 3rd, B. T. Boies.  
**Northern Spy:** 1st, Chatham F. G. A.; 2nd, B. T. Boies; 3rd, Norfolk F. G. A.  
**Wealthy:** 1st, B. T. Boies; 2nd, J. B. Guthrie; 3rd, A. D. Harkness.

#### CLASS 2. DOMESTIC OR HOME MARKET VARIETIES.

##### (a) Barrels ready for Shipment.

- Blenheim:** 1st, A. R. Davison, Danforth.  
**Ontario:** 1st, Harry Dempsey.  
**Tolman:** 1st, Belleville F. G. A.; 2nd, Norfolk F. G. A.  
**Roxbury Russet:** Norfolk F. G. A.; 2nd, Harry Dempsey; 3rd, J. B. Guthrie.  
**Barrel any other variety not named in Class 1:** 1st, Frank Dempsey; 2nd, Belleville F. G. A.; 3rd, Belleville F. G. A.

*(b) Standard Boxes ready for Shipment. (Fruit Unwrapped).*

*Blenheim*: 1st, J. G. Brown; 2nd, Albert Gilbert, Simcoe; 3rd, A. R. Davison.  
*Gravenstein*: 1st, Robert Thompson; 2nd, Frank Dempsey; 3rd, B. T. Boies.  
*Ontario*: 1st, J. B. Guthrie; 2nd, W. G. Watson; 3rd, Harry Dempsey.  
*Ribston*: 1st, J. B. Guthrie; 2nd, Frank Dempsey.  
*St. Lawrence*: 1st, W. G. Watson, Dixie; 2nd, B. T. Boies.  
*Any other desirable variety not named in Class 1*: 1st, B. T. Boies; 2nd, Ainsley Yeager, Simcoe; 3rd, C. L. Stephens, Orillia.

## CLASS 3. DESSERT VARIETIES, PLATES OF 5.

*Fameuse*: 1st, J. B. Guthrie; 2nd, W. G. Watson; 3rd, Norman Brown, Eglinton.  
*Golden Russet*: 1st, Newcastle F. G. A.; 2nd, W. G. Watson; 3rd, Henry Pickett, Clarkson.  
*King*: 1st, W. G. Watson; 2nd, B. Bowlby, Port Dover; 3rd, J. B. Guthrie.  
*McIntosh*: 1st, S. N. Culver, Simcoe; 2nd, F. G. Stewart, Homer; 3rd, H. Dempsey.  
*Wealthy*: 1st, H. G. Watson; 2nd, Frank Dempsey, Albury; 3rd, Nelson Forest, Vittoria.  
*Spy*: 1st, W. G. Watson; 2nd, J. B. Guthrie; 3rd, Norman Brown.  
*Spitzenburg*: 1st, Forest F. G. A.; 2nd, Robert C. Fowler, Burlington; 3rd, W. J. Trinder, Simcoe.  
*Any Other Variety*: 1st, A. M. Smith, Pt. Dalhousie; 2nd, C. L. Stevens; 3rd, W. G. Watson.  
*Seedling. (Any desirable variety)*: 1st, W. G. Watson; 2nd, F. G. Stewart; 3rd, Frank Dempsey.

## CLASS 4. COOKING APPLES, PLATES OF 5.

*Alexandria*: 1st, Norman Brown; 2nd, J. G. Brown; 3rd, J. B. Guthrie.  
*Baldwin*: 1st, H. Pickett; 2nd, R. C. Fowler; 3rd, W. G. Watson.  
*Blenheim*: 1st, W. G. Watson; 2nd, A. R. Davison; 3rd, J. G. Brown.  
*Cayuga*: 1st, B. Bowlby; 2nd, J. C. Wyckoff; 3rd, W. H. Bunting.  
*Greening*: 1st, F. G. Stewart; 2nd, B. Bowlby; 3rd, J. H. Smith.  
*King*: 1st, S. H. Matheson; 2nd, H. Pickett; 3rd, J. B. Guthrie.  
*Ribston*: 1st, Norman Brown; 2nd, R. C. Fowler; 3rd, H. Pickett.  
*Spy*: 1st, W. G. Watson; 2nd, Norfolk F. G. A.; 3rd, Harry Dempsey.  
*Any Other Variety*: 1st, C. L. Stevens; 2nd, Newcastle F. G. A.; 3rd, Newcastle, F. G. A.

## CLASS 5. PYRAMIDS OF FRUIT.

*Pyramids with a Circular Base of 17 inch diameter, or Barrel Hoop size.*

*Ben Davis*: 1st, W. G. Watson; 2nd, Chatham F. G. A.; 3rd, Newcastle F. G. A.  
*Baldwin*: 1st, J. B. Guthrie; 2nd, W. G. Watson; 3rd, Newcastle F. G. A.  
*Blenheim*: 1st, W. G. Watson; 2nd, J. G. Brown.  
*Gravenstein*: 1st, Chatham F. G. A.  
*Fallawater*: 1st, A. R. Davison; 2nd, J. B. Guthrie, 3rd, Chatham F. G. A.  
*Fameuse*: 1st, J. B. Guthrie, 2nd, W. G. Watson; 3rd, Walter Forrester, Rugby.  
*King*: 1st, W. G. Watson; 2nd, J. B. Guthrie; 3rd, J. G. Brown.  
*McIntosh*: 1st, A. D. Harkness, Irena.  
*Ontario*: 1st, W. G. Watson; 2nd, J. B. Guthrie.  
*Spy*: 1st, W. G. Watson; 2nd, William Rickard; 3rd, J. B. Guthrie.  
*Wolf River*: 1st, G. C. Caston; 2nd, Walter Forrester.

## PEARS.

## CLASS 6. PLATES OF 5.

*Anjou*: 1st, Robert Thompson; 2nd, F. G. Stewart.  
*Bosc*: 1st, A. M. Smith; 2nd, Robert Thompson.  
*Clairgeau*: 1st, S. Baker, Simcoe; 2nd, Robert Thompson.  
*Diel*: 1st, Robert Thompson; 2nd, A. M. Smith.  
*Duchess*: 1st, W. F. Fisher, Burlington; 2nd, Chatham F. G. A.  
*Hardy*: 1st, F. G. Stewart; 2nd, Robert Thompson.  
*Howell*: 1st, A. M. Smith; 2nd, Thomas Delworth, Weston.



*Kieffer*: 1st, Robert Thompson; 2nd, W. H. Bunting.  
*Lawrence*: 1st, A. W. Peart, Burlington; 2nd, Robert Thompson.  
*Winter Nelis*: 1st, Robert Thompson; 2nd, F. G. Stewart.  
*Any Other Variety*: 1st, John Force, Simcoe; 2nd, A. M. Smith.

#### CLASS 7. EXPORT VARIETIES.

*Boxes ready for Shipment. (Fruit Wrapped).*

*Anjou*: 1st, G. A. Robertson; 2nd, Biggs Fruit and Produce Co.; 3rd, Robert Thompson.  
*Bosc*: 1st, F. G. Stewart; 2nd, G. A. Robertson; 3rd, Robert Thompson.  
*Clairgeau*: 1st, Robert Thompson; 2nd, G. A. Robertson; 3rd, F. G. Stewart.  
*Duchess*: 1st, Biggs Fruit and Produce Co.; 2nd, G. A. Robertson; 3rd, Robert Thompson.  
*Winter Nelis*: 1st, F. G. Stewart; 2nd, Robert Thompson; 3rd, G. A. Robertson.  
*Kieffer*: 1st, G. A. Robertson; 2nd, Biggs Fruit and Produce Co.; 3rd, Robert Thompson.  
*Lawrence*: 1st, B. T. Boies; 2nd, G. A. Robertson; 3rd, Robert Thompson.  
*Any Other Variety*: 1st, G. A. Robertson; 2nd, Robert Thompson; 3rd, F. G. Stewart.

#### GRAPES.

#### CLASS 8. PLATES AND PACKAGES.

*Agawam*: 1st, F. G. Stewart; 2nd, J. H. Smith, St. Catharines; 3rd, G. A. Robertson.  
*Concord*: 1st, F. G. Stewart; 2nd, G. A. Robertson; 3rd, Robert Thompson.  
*Lindley*: 1st, J. H. Smith; 2nd, Robert Thompson; 3rd, G. A. Robertson.  
*Niagara*: 1st, F. G. Stewart; 2nd, G. A. Robertson; 3rd, W. H. Bunting.  
*Vergennes*: 1st, G. A. Robertson; 2nd, F. G. Stewart; 3rd, Robert Thompson.  
*Wilder*: 1st, Robert Thompson; 2nd, G. A. Robertson; 3rd, J. H. Smith.  
*Any other variety*: 1st, J. H. Smith; 2nd, F. G. Stewart; 3rd, W. M. Robson, Lindsay.  
*Black Grapes, best 9 pound basket*: 1st, G. A. Robertson; 2nd, Robert Thompson; 3rd, F. G. Stewart.  
*Red Grapes, best 9 pound basket*: 1st, G. A. Robertson; 2nd, F. G. Stewart; 3rd, Robert Thompson.  
*White Grapes, best 9 pound basket*: 1st, F. G. Stewart; 2nd, Robert Thompson; 3rd, G. A. Robertson.  
*Black Grapes, best fancy package*: 1st, Robert Thompson; 2nd, G. A. Robertson; 3rd, F. G. Stewart.  
*Red Grapes, best fancy package*: 1st, Robert Thompson; 2nd, G. A. Robertson; 3rd, W. H. Bunting.  
*White Grapes, best fancy package*: 1st, G. A. Robertson; 2nd, Robert Thompson; 3rd, W. H. Bunting.

#### CLASS 9. DISPLAY OF FRUIT IN COMMERCIAL PACKAGES, EXHIBITED BY AN AGRICULTURAL OR HORTICULTURAL SOCIETY, OR FRUIT GROWERS' ASSOCIATION.

1st, St. Catharines Cold Storage and Fruit Growers' Association; 2nd, Norfolk Agricultural Society; 3rd, Grantham Agricultural Society.

*For the best display of Fruit not in Commercial packages, exhibited by an Agricultural or Horticultural Society, or Fruit Growers' Association.*

1st, St. Catharines Cold Storage and Fruit Growers' Association; 2nd, Norfolk Agricultural Society; 3rd, Grantham Agricultural Society; 4th, Orillia Horticultural Society.

#### PRESERVED FRUIT.

#### CLASS 10. QUART SEALER OF CANNED FRUIT.

*Blackberries*: 1st, Mrs. W. H. French, Oshawa; 2nd, John Downham, Strathroy; 3rd, Mrs. T. Delworth.

*Cherries, Black or Red*: 1st, Mrs. R. Thompson, St. Catharines; 2nd, Mrs. F. G. Stewart, Homer; 3rd, John Downham.

*Cherries, White:* 1st, Mount Pleasant Women's Institute; 2nd, Mrs. R. Thompson; 3rd, Mrs. F. G. Stewart.  
*Gooseberries:* 1st, Mrs. W. H. French.  
*Grapes, Black or Red:* 1st, Mrs. R. Thompson; 2nd Mrs. T. Delworth; 3rd, Miss Lizzie Tasker, St. Catharines.  
*Grapes, White:* 1st, Mrs. F. G. Stewart; 2nd, Mrs. R. Thompson; 3rd, Mrs. T. Delworth.  
*Peaches, White:* 1st, Mrs. R. Thompson; 2nd, Mrs. F. G. Stewart; 3rd, Mrs. T. Delworth.  
*Peaches, Yellow:* 1st, Mrs. T. Delworth; 2nd, Miss Lizzie Tasker; 3rd Mrs. F. G. Stewart.  
*Pears:* 1st, John Downham; 2nd, Mt. Pleasant Women's Institute; 3rd, Mrs. F. G. Stewart.  
*Plums, Blue or Red:* 1st, Mrs. T. Delworth; 2nd, Mrs. R. Thompson; 3rd, Mrs. F. G. Stewart.  
*Plums, Green or White:* 1st, Mrs. W. H. French; 2nd, Mrs. R. Thompson; 3rd, Mrs. F. G. Stewart.  
*Raspberries, Red:* 1st, John Downham; 2nd, Mrs. W. H. Bunting; 3rd, Miss Carrie S. Rush, Humber Bay.  
*Raspberries, Black:* 1st, Mrs. W. H. French; 2nd, Mrs. F. G. Stewart; 3rd, Mrs. R. Thompson.  
*Strawberries:* 1st, Mt. Pleasant Women's Institute; 2nd, Miss Lizzie Tasker; 3rd, John Downham.

#### CLASS 11. PINT JAR OF JAM.

*Currant, Black:* 1st, Mrs. R. Thompson; 2nd, Mrs. F. G. Stewart; 3rd, Miss Carrie S. Rush.  
*Grape:* 1st, Mrs. R. Thompson; 2nd, Miss Helen McKay, Doncaster; 3rd, Miss Lizzie Tasker.  
*Peach:* 1st, Miss Carrie S. Rush; 2nd, Mrs. T. Delworth; 3rd, Mrs. R. Thompson.  
*Pear:* 1st, Mrs. R. Thompson; 2nd, Mrs. F. G. Stewart; 3rd, Mrs. T. Delworth.  
*Plum:* 1st, Mrs. R. Thompson; 2nd, Mrs. F. G. Stewart; 3rd, Mrs. T. Delworth.  
*Raspberry:* 1st, Miss Carrie S. Rush; 2nd, Mrs. T. Delworth; 3rd, Mrs. R. Thompson.

#### CLASS 12. PINT OF JELLY.

*Apple:* 1st, Miss Charlotte E. Shaw, Oakville; 2nd, Mrs. J. W. Sparling, Bowmanville; 3rd, W. H. Stevenson, Oshawa.  
*Crab Apple:* 1st, Mrs. T. Delworth; 2nd, Mrs. A. M. Smith; 3rd, Mrs. J. W. Sparling.  
*Red Currant:* 1st, Mrs. J. W. Sparling; 2nd, Miss Carrie S. Rush; 3rd, Norman Brown.  
*Grape:* 1st, Mrs. J. W. Sparling; 2nd, Mrs. R. Thompson; 3rd, Mrs. F. G. Stewart.  
*Quince:* 1st, Miss Lizzie Tasker; 2nd, Mrs. W. H. Bunting; 3rd, Miss Charlotte E. Shaw.  
*Red Raspberry:* 1st, Mrs. P. W. Hodgetts; 2nd, Mrs. J. W. Sparling; 3rd, Mrs. R. Thompson.  
*Strawberry:* 1st, Mrs. T. Delworth; 2nd, Mrs. R. Thompson; 3rd, Mrs. F. G. Stewart.

#### CLASS 13. GRAPE JUICE.

1st, Miss A. L. Martin, Toronto; 2nd, Miss Lizzie Tasker; 3rd, Mrs. F. G. Stewart.

#### CLASS 14. KING EDWARD HOTEL SPECIAL PRIZE.

4 Jars of Fruit: 1st, Mrs. Lewis Vair, Barrie.

#### COUNTY PRIZE LIST.

##### BRANT.

*Baldwin:* 2nd, J. W. Clark, Cainsville.  
*Blenheim:* 1st, J. W. Clark.  
*Golden Russet:* 2nd, J. W. Clark.  
*Greening:* 1st, J. W. Clark.  
*Mann:* 1st, J. W. Clark.  
*Spy:* 2nd, J. W. Clark.



## BRUCE.

*Baldwin*: 1st, W. A. Rowand, Walkerton.  
*Blenheim*: 1st, W. A. Rowand.  
*Fameuse*: 1st, W. A. Rowand.  
*Golden Russet*: 1st, M. G. Dippel, Walkerton; 2nd, W. A. Rowand.  
*Greening*: 1st, M. G. Dippel; 2nd, W. A. Rowand.  
*Mann*: 1st, W. A. Rowand.  
*Spy*: 1st, M. G. Dippel; 2nd, W. A. Rowand.

## GREY.

*Baldwin*: 1st, J. I. Graham, Vandeleur; 2nd, A. Gifford, Meaford.  
*Ben Davis*: 1st, A. Gifford; 2nd, J. I. Graham.  
*Canada Red*: 1st, J. I. Graham.  
*Golden Russet*: 1st, J. I. Graham; 2nd, D. Harrow, Vandeleur.  
*Gravenstein*: 1st, J. I. Graham.  
*Greening*: 1st, J. I. Graham.  
*King*: 1st, J. I. Graham.  
*Spy*: 1st, A. Gifford; 2nd, J. I. Graham.

## HALTON.

*Baldwin*: 1st, A. Riach, Bronte; 2nd, G. S. Peart, Burlington.  
*Cranberry*: 1st, G. S. Peart; 2nd, A. Riach.  
*Golden Russet*: 1st, A. Riach; 2nd, G. S. Peart.  
*Greening*: 1st, G. S. Peart.  
*King*: 1st, A. Riach.  
*Mann*: 2nd, G. S. Peart.  
*Spy*: 1st, A. Riach; 2nd, G. S. Peart.  
*Ribston*: 1st, G. S. Peart.  
*Roxbury Russet*: 1st, A. Riach; 2nd, G. S. Peart.

## HASTINGS.

*Baldwin*: 1st, John Aris, Belleville; 2nd, John Graham, Wallbridge.  
*Ben Davis*: 1st, John Graham; 2nd, John Aris.  
*Fameuse*: 1st, John Aris.  
*Golden Russet*: 1st, John Graham; 2nd, John Aris.  
*Greening*: 1st, John Aris; 2nd, John Graham.  
*King*: 1st, John Graham; 2nd, John Aris.  
*Spy*: 1st, John Graham; 2nd, John Aris.  
*Stark*: 1st, John Graham; 2nd, John Aris.  
*Wealthy*: 2nd, John Aris.  
*Any Other Variety*: 1st, John Aris; 2nd, John Graham.

## KENT.

*Baldwin*: 1st, Mrs. A. Dolsen, Chatham; 2nd, J. Johnston, Chatham.  
*Gravenstein*: 1st, C. McPherson, Cedar Springs; 2nd, J. E. Hambly, Cedar Springs.  
*Greening*: 1st, J. Johnston; 2nd, C. J. Ross.  
*King*: 1st, C. J. Ross.  
*Spy*: 1st, H. McCully, Mull; 2nd, J. E. Hambly.  
*Stark*: 1st, J. E. Hambly.  
*Wealthy*: 1st, G. W. Boley.

## LAMBTON.

*Baldwin*: 1st, Forest F. G. A.; 2nd, Arkona F. G. A.  
*Ben Davis*: 1st, Arkona F. G. A.; 2nd, Forest F. G. A.  
*Canada Red*: 1st, W. A. Broughton.  
*Fallawater*: 1st, W. A. Broughton; 2nd, Forest F. G. A.  
*Golden Russet*: 1st, Forest F. G. A.  
*Greening*: 1st, Forest F. G. A.; 2nd, Arkona F. G. A.  
*Hubbardston*: 1st, Forest F. G. A.; 2nd, W. A. Broughton.  
*King*: 1st, Forest F. G. A.; 2nd, Arkona F. G. A.  
*Spy*: 1st, Forest F. G. A.; 2nd, Arkona F. G. A.

## LEEDS AND GRENVILLE.

*Baxter*: 1st, J. H. Warner; 2nd, Harold Jones, Maitland.  
*Canada Red*: 1st, William Beddie, Prescott; 2nd, W. E. Skinner, Prescott.  
*Fameuse*: 1st, William Beddie; 2nd, J. H. Warner.  
*Golden Russet*: 1st, J. H. Warner; 2nd, Ed. Keller, Maitland.  
*McIntosh*: 1st, J. H. Warner; 2nd, Ed. Keller.  
*Scarlet Pippin*: 1st, Ed. Keller; 2nd, J. H. Warner.  
*Scott Winter*: 1st, J. H. Warner; 2nd, Ed. Keller.  
*Wealthy*: 1st, William Beddie; 2nd, Ed. Keller.  
*Any Other Variety*: 1st, J. H. Warner.

## LINCOLN.

*Baldwin*: 1st, F. G. Stewart, Homer; 2nd, W. S. Thompson, St. Catharines.  
*Blenheim*: 1st, W. S. Thompson; 2nd, F. G. Stewart.  
*Duchess*: 1st, W. S. Thompson; 2nd, F. G. Stewart.  
*Fameuse*: 1st, F. G. Stewart; 2nd, W. S. Thompson.  
*Golden Russet*: 1st, C. M. Honsberger, Jordan Station; 2nd, W. S. Thompson.  
*Greening*: 1st, C. M. Honsberger, Jordan Station; 2nd, W. S. Thompson.  
*King*: 1st, W. S. Thompson; 2nd, F. G. Stewart.  
*Spy*: 1st, W. S. Thompson; 2nd, C. M. Honsberger.  
*Ribston*: 2nd, C. M. Honsberger.

## NORFOLK.

*Baldwin*: 1st, Norfolk F. G. A.; 2nd, Albert Gilbert, Simcoe.  
*Blenheim*: 1st, Norfolk F. G. A.; 2nd, Charles Trinder.  
*Fameuse*: 1st, Norfolk F. G. A.; 2nd, Ed. Matthews.  
*Golden Russet*: 1st, Norfolk F. G. A.; 2nd, J. S. Wyckoff.  
*Greening*: 1st, Norfolk F. G. A.; 2nd, B. Bowlby, Port Dover.  
*King*: 1st, Norfolk F. G. A.; 2nd, B. Bowlby.  
*Spy*: 1st, Norfolk F. G. A.; 2nd, Charles Trinder.  
*Spitzenburg*: 1st, Norfolk F. G. A.; 2nd, W. J. Trinder.  
*Yellow Bellflower*: 1st, B. Bowlby; 2nd, D. Wintermate.  
*Any Other Variety*: 1st and 2nd, Norfolk F. G. A.

## NORTHUMBERLAND AND DURHAM.

*Alexander*: 1st, D. J. Gibson, Newcastle.  
*Baldwin*: 1st, Frank H. Hall; 2nd, Newcastle F. G. A.  
*Ben Davis*: 1st, P. C. Dempsey; 2nd, D. J. Gibson.  
*Fameuse*: 1st, Ed. Hanna, Janetsville; 2nd, D. J. Gibson.  
*Golden Russet*: 1st, P. C. Dempsey; 2nd, F. H. Hall, Wicklow.  
*Greening*: 1st, D. J. Gibson; 2nd, P. C. Dempsey.  
*King*: 1st, Newcastle F. G. A.; 2nd, P. C. Dempsey.  
*McIntosh*: 1st, E. C. Beman, Newcastle.  
*Spy*: 1st, William Rickard, Newcastle; 2nd, P. C. Dempsey.  
*Wealthy*: 1st, E. C. Beman; 2nd, P. C. Dempsey.

## ONTARIO.

*Baldwin*: 1st, R. W. Grierson, Oshawa; 2nd, Enos Remmer, Pickering.  
*Ben Davis*: 1st, Walter McGregor, Whitby; 2nd, W. H. Stevenson, Oshawa.  
*Fameuse*: 1st, W. H. Stevenson, Oshawa.  
*Golden Russet*: 1st, W. H. French, Oshawa; 2nd, W. H. Stevenson.  
*Gravenstein*: 2nd, Gervais Cornell, Pickering.  
*Greening*: 1st, W. H. Stevenson; 2nd, Enos Remmer.  
*King*: 1st, W. H. Stevenson; 2nd, Gervais Cornell.  
*Spy*: 1st, R. W. Grierson; 2nd, W. H. French.  
*Any Other Variety*: 1st, W. H. Stevenson; 2nd, Walter McGregor.

## OXFORD.

*Baldwin*: 1st, J. C. Harris, Ingersoll; 2nd, E. M. Hersee, Eastwood.  
*Ben Davis*: 1st, J. C. Harris.  
*Fameuse*: 1st, E. Hersee; 2nd, J. C. Harris.  
*Golden Russet*: 1st, E. Hersee; 2nd, William Newton, Woodstock.  
*Greening*: 1st, R. W. Newton; 2nd, Andrew McKay, Woodstock.  
*King*: 1st, R. W. Newton; 2nd, M. G. Schell, Woodstock.  
*Spy*: 1st, J. C. Fullick, Woodstock; 2nd, J. C. Harris.



*Seek*: 1st, J. C. Harris; 2nd, Andrew McKay.  
*Tolman*: 1st, J. C. Harris; 2nd, M. G. Schell.

## PERTH.

*Baldwin*: 1st, J. O. Coles, Munro.  
*Blenheim*: 1st, J. O. Coles.  
*Ben Davis*: 1st, J. O. Coles.  
*Cranberry*: 1st, J. O. Coles.  
*Golden Russet*: 1st, J. O. Coles.  
*Greening*: 1st, J. O. Coles.  
*King*: 1st, J. O. Coles.  
*Spy*: 1st, J. O. Coles.  
*Seek*: 1st, J. O. Coles.  
*Any Other Variety*: 1st, J. O. Coles.

## PRINCE EDWARD.

*Baldwin*: 1st, Harry Dempsey, Rednerville; 2nd, Frank Dempsey.  
*Cranberry*: 1st, Harry Dempsey; 2nd, Frank Dempsey.  
*Fameuse*: 1st, Frank Dempsey; 2nd, Harry Dempsey.  
*Gano*: 1st, Frank Dempsey; 2nd, Harry Dempsey.  
*Golden Russet*: 1st, Harry Dempsey; 2nd, Frank Dempsey.  
*King*: 1st, Frank Dempsey; 2nd, Harry Dempsey.  
*McIntosh*: 1st, Frank Dempsey; 2nd, Harry Dempsey.  
*Spy*: 1st, Harry Dempsey; 2nd, Frank Dempsey.  
*Stark*: 1st, Frank Dempsey; 2nd, Harry Dempsey.  
*Wealthy*: 1st, Harry Dempsey; 2nd, Frank Dempsey.

## EAST SIMCOE.

*Alexander*: 1st, W. Forrester, Rugby; 2nd, D. Cotton, Orillia.  
*Baxter*: 1st, C. L. Stephens, Orillia.  
*Fameuse*: 1st, C. L. Stevens, Orillia; 2nd, Walter Forrester, Rugby.  
*McIntosh*: 1st, C. L. Stevens; 2nd, G. Hewett, Ardtrea.  
*Golden Russet*: 1st, C. L. Stevens; 2nd, R. H. Jupp.  
*King*: 2nd, C. L. Stevens.  
*Spy*: 2nd, C. L. Stevens.  
*Any Other Variety*: 1st and 2nd, C. L. Stevens.

## STORMONT, DUNDAS AND GLENGARRY.

*Alexander*: 1st, Andrew Harkness, M. D., Lancaster.  
*Baxter*: 1st, Andrew Harkness, M. D.; 2nd, A. D. Harkness, Irena.  
*Fameuse*: 1st, A. D. Harkness; 2nd, J. D. Campbell.  
*McIntosh*: 1st, Nicholas Evertts, Iroquois; 2nd, A. D. Harkness.  
*Northwest Greening*: 1st, Andrew Harkness, M. D.  
*Scott Winter*: 1st, A. D. Harkness; 2nd, J. D. Campbell.  
*Wealthy*: 1st, J. D. Campbell; 2nd, A. D. Harkness.  
*Wolf River*: 2nd, J. D. Campbell.  
*Any Other Variety*: 1st and 2nd, A. D. Harkness.

## VICTORIA.

*Alexander*: 1st, W. M. Robson, Lindsay; 2nd, Thomas Beall, Lindsay.  
*Fameuse*: 1st, Thomas Beall; 2nd, W. M. Robson.  
*Golden Russet*: 1st, Thomas Beall; 2nd, W. M. Robson.  
*McIntosh*: 1st, W. M. Robson.  
*Spy*: 1st, Thomas Beall; 2nd, W. M. Robson.  
*Wealthy*: 1st, W. M. Robson.  
*Yellow Bellflower*: 1st, Thomas Beall; 2nd, W. M. Robson.

## YORK.

*Alexander*: 1st, J. G. Brown.  
*Blenheim*: 1st, S. H. Matheson; 2nd, J. G. Brown.  
*Fameuse*: 1st Charles Plunkett, Woodbridge; 2nd, M. W. Robertson, Kettleby.  
*Golden Russet*: 1st, Charles Plunkett; 2nd, J. G. Brown.  
*Greening*: 1st, J. G. Brown; 2nd, A. R. Davison.  
*King*: 1st, M. W. Robertson; 2nd, S. H. Matheson.  
*McIntosh*: 1st, M. W. Robertson; 2nd, A. R. Davison.  
*Spy*: 1st, A. R. Davison; 2nd, J. G. Brown.  
*St. Lawrence*: 1st, Charles Plunkett.

# APPENDIX "D"

## SAN JOSE SCALE.

### OUTLINE OF WORK PERFORMED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, 1897-1907.

By W. B. VARLEY.

The existence in the Niagara District of the San Jose Scale was first brought to the attention of the Department early in 1897 through the Ontario Fruit Growers' Association. Mr. W. M. Orr, who was in charge of the experiments in spraying for the Department at the time, was directed to ascertain the extent of the infestation. A bulletin was prepared by the Professor of Biology, at the Ontario Agricultural College, describing the insect, and the methods of treatment by whale-oil soap wash, kerosene emulsion, resin washes, etc. (See p. 11, O. A. C. Report, 1897). Mr. Orr in his report (file 8840), dated October 28, 1897, stated "I have located fruit trees from infested nurseries in New Jersey at 85 points in the Province extending from Ottawa to Chatham and Leamington." Inspector Orr was thereupon instructed by the Minister to follow up this nursery stock and destroy it "on the spot," if scale were found to be present; the object being to "entirely stamp out the pest if possible." In November of the same year Mr. Orr reported that he had found scale in six orchards in Essex county; that "thousands of trees were infested and that many would have to be burned." In his reply, the Minister referred to the fact that American authorities were advocating spraying treatment and he expressed the fear, based on the difficulty that existed in inducing farmers to spray for other pests, that if treatment were resorted to it would, in the end, result in the infestation spreading wider and wider year by year.

At the Session of the Legislature, 1898, an Act was passed entitled "An Act to Prevent the Spread of the San Jose Scale." This Act provided that all plants found to be infested with San Jose Scale should be cut down and destroyed by burning, and that compensation, not exceeding one-fourth of the value of the plant destroyed (not including fruit), should be paid.

At about this time a deputation from the Ontario Fruit Growers' Association waited upon the Minister of Agriculture at Ottawa, and as a result of their representations, provision was made for the thorough fumigation under Government inspection of all imported nursery stock, and its entry was restricted to certain points on the boundary of the Province. A very vigorous policy was then entered upon; a large inspection staff was organized with G. E. Fisher, of Freeman, as Chief Inspector, and an effort made to locate all infested orchards in the Niagara District, and in Essex and Kent, and destroy infested trees. In the year 1898, \$12,911.86 was expended on the work of inspection, \$6,231.00 for compensation, and \$146.00 for printing bulletins, etc., a total of \$19,290.00. The inspection work was confined to trees that had been planted for five years or less in the counties of Halton, Wentworth, Welland, Lincoln, Essex, Kent and Elgin. This work developed the fact that the scale had been present in the Province for at least seven years. It was also discovered that during the previous spring stock from infested Ontario nurseries had been sent to nearly every county in the Province and planted.



Under the Minister's instructions, the Inspector procured a list of the sales, and as a result stock from these nurseries was located at 100 different points in the Province, and the trees destroyed. The Inspector was then instructed to make a thorough examination of nurseries, and seven of them were found to be infested. The infested stock was destroyed.

While this work was progressing, deputations from Niagara and Essex waited upon the Minister, protesting against the destruction of trees. In the west, the greatest antagonism was aroused. In some instances attempts were made by force to prevent inspectors gaining admission. Public opinion finally compelled the Department to desist from the work of destruction, and as a result the scale again made rapid headway.

During this time the nurseries were inspected by three of the professors of the Ontario Agricultural College, and the work of fumigating the stock with hydrocyanic acid gas was inaugurated.

During 1899, \$15,786.00 was spent on inspection of orchards; \$10,603.00 in compensating owners; including everything, the total cost of the work that year being \$27,770.50.

Owing to the protests made by owners of orchards, and to the fact that the scale was much more widespread, and much longer established than was supposed at the inception of the work, and that it existed in Ontario nurseries the Minister concluded to appoint a commission to discuss matters with the growers. Dr. Mills of the O. A. C., John Dearness, of London, and W. H. Bunting, of St. Catharines, conducted the enquiry. Their report recommended that opportunity should be given growers to treat their trees in place of destruction by burning. Accordingly in the spring of 1900, an amendment was passed to the San Jose Scale Act, (63 Vic., c. 46, s. 2):—

- (1) Permitting the adoption of regulations for the treatment of infested plants by spraying;
- (2) Prohibiting the removal of nursery stock from a nursery unless the same had been fumigated.

From then on the compulsory destruction of trees was discontinued, and the work took the form of investigating remedies, apparatus for spraying, identifying the scale for growers, instructing them in the preparation and application of the mixtures recommended, superintending the fumigation of nursery stock, supplying growers with spraying materials at one-half cost. These materials consisted chiefly of whale-oil soap and crude petroleum. The results of the experiments were published, and efforts were made by the Department to arouse growers to the seriousness of the infestation, and as to necessity for prompt measures to keep the scale in check. Great indifference was at first encountered, but in the Niagara District this gradually gave way to a due appreciation of the situation.

During the year 1900, \$7,112 was expended on the San Jose Scale work. This included an extra allowance made to certain growers in Kent County, whose trees had been destroyed, and who were greatly dissatisfied at the amount they had previously received.

At the Fruit Growers' meeting in the autumn of 1900, Professor Lochhead said as follows:—"The Government should pass a measure which would compel the owners of orchards either to spray their trees or to pay for the spraying of the trees when done by the Government."

In 1901, the work, as outlined in 1900, was continued, the sum of \$4,250 being expended.

In the autumn of 1901 the Fruit Growers' Association passed a resolution, (Report of the O. F. G. A., 1901, p. 25), which led to the following amendments being made to the Act at the session of 1902:—

(1) That a municipality might appoint local inspectors to enforce the provisions of the Act, and that upon the petition of fifteen or more ratepayers they were compelled to appoint said inspector, the Department paying one-half the remuneration of said inspector.

(2) Requiring owners of orchards to effectually treat their trees with the remedies set forth in the Act, or prescribed by the Department, or else to destroy same by fire, subject to the penalties prescribed by the Act.

The effect of this amendment was to place the onus of inspection on the municipalities interested, the work to be performed under the general direction of the Department through the Chief Inspector.

In 1902, the work already indicated was continued at an expenditure of \$7,237 for the year, including \$375 additional compensation to certain growers in Kent.

At the Fruit Growers' Convention in the autumn of 1902, the Chief Scale Inspector recommended the use of the lime-sulphur wash, with which he had previously conducted experiments for two years, as being cheaper, safer and more effective than any other remedy. Articles and bulletins explaining this remedy were published and distributed by the Department, practical demonstrations were continued, and sulphur was added to the list of spraying materials supplied at a reduced cost.

In the autumn of 1903, Professor Lochhead made the following statement at the Entomological Convention:—"Never before has the San Jose Scale problem seemed so easy of solution as it is to-day. After long experimentation we now know that we have methods which are both effective and easy to apply. The whole solution of the difficulty lies now with the fruit grower himself." (p. 42, Entomological Society Report, 1903.)

In 1903, \$3,712 was expended in the work. The Department at this time agreed to supply spraying materials at wholesale rate, and to pay the freight thereon, instead of at half cost.

In 1904, the amount expended was \$4,281.

The orchard inspection staff was now discontinued, it being left in the hands of the municipalities to carry on the work. Inspector Fisher retired, and his Assistant, J. Fred Smith, of Glanford, took his place, being employed casually by the Department as occasion required.

In April, 1905, Inspector Smith was instructed to visit the County of Kent and report on the conditions prevailing. He reported that the infested area comprised the whole of the township of Harwich, the southwestern half of the township of Howard, and that it was spreading westward to the township of Raleigh. It was in the township of Harwich that seven original areas of infestation were located in 1899, and from these the scale had since spread. During the intervening six years, he stated that it had spread on an average a distance of three miles. He further reported that the feeling of the owners continued to be for the most part one of indifference, as it had been from the first, the people stating that for the past five or six years at any rate, the apple crop had not been worth the picking. The fruit being of no value it was impossible to make the people feel any interest in their orchards. This feeling was accentuated because of the fact that so many were making money out of beans, corn, wheat and pork. He stated that along what was known as the "ridge," however, there were some very fine orchards and the people were selling lots of fruit. Likewise in the Chatham section a co-operative fruit association had been organized with



upwards of twenty farmers as members. This company had purchased a power sprayer, and was spraying the orchards of the members.

He further stated that the prevailing view was that the Department should purchase a number of power machines, put them in charge of spraying gangs, and spray all orchards, charging the owners pro rata for the work.

With the conclusion of the spraying season of 1905, the distribution of spraying materials at cost was discontinued.

In May, 1905, the inspector was instructed to inspect orchards in the vicinity of St. Thomas, Courtwright and Sparta, in Elgin County. These were original points of infestation. In a hurried inspection he failed to find scale outside of the original orchards, but in them he found plenty of scale. He endeavored to induce the owners to treat.

In May, 1906, H. P. Jeffrey, of Blytheswood, the local inspector for the township of Mersea, in the County of Essex, reported the existence of scale in some 19 orchards at Leamington and Blytheswood, but that he had not been over half the fruit district. He stated that the owners were disposed to treat their orchards, and had already made a beginning in that direction. Inspector Jeffrey called attention to the fact that some of the farms on which scale was found were untenanted. The chief inspector was sent into the district, and Mr. Jeffrey afterwards wrote the Department that he (the Chief Inspector), had been of great help in stirring up the farmers to take action.

In October, 1906, a new infestation was reported in the vicinity of Tillsonburg, in Oxford County, near the borders of Elgin and Norfolk. The Inspector was sent and found one orchard badly infested, and 7 others slightly infested. He reported that the people expressed a willingness to try to save their orchards.

In January, 1907, on account of several requests for assistance having been sent to the Department, a series of meetings was arranged in East Kent, to secure information on the situation, and if possible to devise a means of coping with it. The delegation consisted of Chief Inspector Smith, and Joseph Tweddle of Fruitland. They held meetings at Ridgetown, Guilds, Blenheim, Kent Bridge, Eberts and Chatham. They informed the people that the Department was prepared to place a spraying outfit in the district, and spray at a cost to growers of 10c. per tree, if such a course met with approval. At four of the six meetings no resolution was passed asking for any assistance. At Guilds, a resolution was passed in opposition to the Department doing anything; and at Blenheim, the same feeling was freely expressed. On the other hand, at Ridgetown and Chatham, resolutions were passed asking for assistance. The Ridgetown resolution asked for a power sprayer to operate at a nominal cost to growers. The Chatham resolution asked the Government to appropriate a sum to investigate parasitic enemies of the scale and codling moth, and to conduct experiments with the various proprietary remedies offered to the public for the treatment of scale, with a view to securing an efficient, cheap and easily applied remedy.

As to the state of the orchards, the commissioners reported that the orchards at Ridgetown, Blenheim and Guilds were largely past redemption, and that owners there did not seem to think it worth while for the Government to do anything in the matter. At Chatham, Kent Bridge and Eberts, conditions were different, and the people seemed disposed to treat their trees or have the Government do so for them on the basis mentioned, as in those sections there had been no serious loss of trees. At Kent Bridge a co-operative association was formed at the meeting.

In the Township of Mersea, in the County of Kent, four inspectors have this year been appointed to deal with the situation.

The foregoing will give a general idea of the conditions prevailing in the scale areas of the western district at the present time.

In the Niagara District, owing to the efforts of the Department, and the importance of the interest at stake, growers have been thoroughly aroused to the importance of fighting the scale. They are now doing so pretty generally, and have been for some time past.

In 1906, the scale was reported near Effingham, in the township of Pelham, and the Inspector was sent to report on the situation. He found scale at several points in the neighborhood. The Minister urged the municipal authorities to appoint a local Inspector to carry out the provisions of the Act, which they afterwards did. The adjoining township of Thorold also appointed an Inspector shortly afterwards.

It will be observed from the foregoing that the conditions prevailing in the County of Kent are peculiar to the district, that is to say, the farmers are not for the most part making any money out of their fruit, and therefore are indifferent. The question arises what should the Department do under these special circumstances to cope with the situation.

The facts are these:—

1. The majority of the growers will not treat their trees.
2. Many of the trees cannot now be saved by treatment; others are too large to be properly treated. On the other hand there are areas where the trees are less infested where they can be saved by prompt treatment, and where the owners are anxious for the Department to help them.
3. That if systematic action is taken, the spread of the pest may be stopped, both there and at Tillsonburg and St. Thomas, and thousands of trees saved that are not yet infested beyond redemption.

The suggestion is made that the Department should operate a number of power sprayers in the district, and treat all trees at a nominal cost. This would entail a large outlay to operate, materials, etc. The spraying season is short and more than one outfit would be needed to cover the ground. The work must be efficiently done, and the Department finds great difficulty in securing the services of men who are competent to perform it. Then the question arises, how are men who do not want their trees treated, and who will pay nothing for treatment, to be dealt with? Their trees should be sprayed in the common interest; so should the infested trees on untenanted farms, or they will remain a source of infestation for treated orchards.

If this work is once undertaken, it will have to be continued from year to year, as treatment does not eradicate the pest, at least not unless followed up thoroughly for a number of seasons.

Having undertaken the work in the west, the Department would have to be prepared, as Inspector Smith points out, to conduct similar operations throughout the Niagara District, which would mean going into the business on a very large scale. It would probably call for the employment of a Superintendent who would take exclusive charge of the whole matter, thoroughly organize the work, and follow it up systematically from year to year.

The matter of the introduction of parasites for scale and codling moth has not been touched upon, but it may be stated briefly, that investigations undertaken in the United States at great expense conclusively show that no assistance is to be looked for in this direction at the present stage in combatting these pests.



So far as the investigation of new remedies is concerned, the Department has made and will continue to make experiments with them. To this end the Department keeps in touch with developments in the United States, and with the experiments that are being conducted there.

The part that the local co-operative Associations are playing in combatting the codling moth, the San Jose Scale and other insects destructive to fruit and fruit trees, should not be overlooked in this connection. These Associations are being organized throughout the Province, at the instigation of the Department through the medium of the Ontario Fruit Growers' Association, with which they are affiliated. They have for their object the co-operation of their members in the packing and marketing of their fruit. Twenty-eight have been organized up to the present. In some instances, notably at Chatham and Newcastle, the Associations have power spraying outfits, and charge the members with the work done. Other Associations make spraying by their members, one of the rules of membership. Owing to the fact that these Associations are making the business of fruit growing much more profitable, no difficulty is experienced in getting the spraying done by their members. It is felt that the extension of these Associations and the results they are demonstrating as to the value of spraying will do more to arouse the public to spray than any demonstrations conducted by the Department, and more than any compulsory law on the Statute book could possibly accomplish.

The following municipalities have appointed Township Scale Inspectors:

	No.		No.
Saltfleet (Wentworth) .....	2	Thorold (Welland) .....	1
North Grimsby (Lincoln).....	3	Clinton (Lincoln) .....	2
Louth (Lincoln) .....	1	Barton (Wentworth) .....	1
Pelham (Welland) .....	1	Mersea (Essex) .....	4

TORONTO, March 11th, 1907.

# APPENDIX "E"

## A BRIEF STUDY OF THE PEACH INDUSTRY.

By ALDEN BLAIR CUTTING, B.S.A., "CANADIAN HORTICULTURIST," TORONTO.

The purpose of this article is to offer for the consideration of growers and all persons interested in the peach industry, some ideas gained by personal experience, observation, and investigation in different peach districts of Canada and the United States. During the summer of 1903, the writer made a brief study of the peach industry of the State of Georgia. Many of the ideas set forth in the following pages are based upon the result of that study. Particular and frequent reference is made to methods practised in the great Hale orchards, of Fort Valley, Ga., where an up-to-date intensive system, on an extensive plan, is carried out. The results of investigations in other peach sections also are noted when fitting and opportune. An outline of the writer's experiments in winter spraying at Guelph will be found in its place, as well as some work on soil analysis. The leading writers on peach culture have been occasionally consulted and drawn upon to verify and complete the chronicle of our own somewhat limited observations and experience. The knowledge gleaned from these various sources has been applied, in the preparation of this article, to the condition of things in Ontario.

It has not been our purpose, however, to attempt a full and exhaustive treatise on the subject. To solve the thousand and one little and great problems that attend the culture of the peach, would be the work of a lifetime and probably a work in vain. Volumes could be written on each particular phase of the industry. In a comparatively short article, and one that is intended to cover briefly the whole subject, only the fundamental principles can be considered. For these reasons, we hope that the reader will pardon our sins of abbreviation and omission, and we trust that he may find something of interest as well as profit in what the following pages may tell.

I beg to acknowledge most gratefully the very valuable assistance that has been furnished me in the preparation of this article. I desire particularly to thank Mr. J. H. Hale, of South Glastonbury, Conn., Mr. J. H. Baird, Superintendent Hale-Georgia Orchard Co., Fort Valley, Ga., and his late assistant Mr. J. S. Seeley, for the many kind privileges afforded me when in Georgia, and for imparting to me a wealth of practical information. I am deeply indebted, also, to Mr. G. Harold Powell, Pomologist in charge of Fruit Storage Investigations, Washington, D.C., for valuable information and for the use of prints from which figures 2, 3, 4, 9, 10, 11, and 12 were taken. My thanks are due Prof. H. L. Hutt, Horticulturist at O.A.C., for figures 1, 5, 6, 7, 8, 15, 16, 17 and 18; and Prof. J. B. Reynolds, O.A.C., Guelph, for material assistance and for the use of apparatus required for making soil analyses. The bulletins of the North Carolina State Board of Agriculture dealing with some of the by-products of the industry, and one or two other up-to-date articles, were looked into to fill an



occasional gap in this article and to round off the corners. I wish also to thank those who have sent me samples of soils for analysis, and finally to tender my appreciation and acknowledgment of any favors received from sources that are not here specified.

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## THE HISTORY AND EXTENT OF PEACH CULTURE.

The peach is probably indigenous to China, and is supposed to have been introduced into Europe by way of Persia, from whence it takes its name. The date of its introduction into Europe is not definitely known. Historians tell us that it was grown and valued by the Romans in the first century. From Italy, it was carried into England about the 16th century by way of France.

Near the end of the 17th century the peach was introduced into America by the early settlers. Although a native of a foreign country, it is here that its greatest perfection has been attained. Undoubtedly, the United States is the greatest peach growing country in the world, and Georgia is the greatest peach state in the Union, being closely followed by Michigan. The States of California, Ohio, New York, Pennsylvania, Maryland, Delaware, and New Jersey also grow peaches more or less extensively. In Virginia, the mother state of peach culture, the industry is now almost abandoned. If the signs of the times fail not, it is safe to predict that the banner peach state of the future will be Texas, where to-day thousands upon thousands of acres are being planted.

In the northern states and Canada, peach regions are determined by the evenness and mildness of the climate in winter. The chief areas lie near the great lakes which have an ameliorating effect upon the climate. Near the sea coast the winds are usually too strong. In Canada, the chief peach-growing districts are found in the Niagara peninsula of Ontario, and in the counties bordering along Lake Erie.

Mr. W. W. Hilborn, of Leamington, states that peach culture in the Essex peninsula assumed large proportions prior to the freeze-out of 1899. Several thousand acres were planted to that fruit. Most of the orchards were well taken care of, hence were in fine condition, and the outlook was very promising. Long continued cold without any snow on the ground during the months of January and February of 1899 killed the trees by root-freezing. The tops were comparatively uninjured. After the freeze-out of 1899, quite a large acreage was replanted only to meet the same fate during the winter of 1904. Many of the growers are trying again, but are not going into it on so large a scale. Various methods of root protection will now be used, mostly cover crops with the addition perhaps of some coarse material spread around the base of the trees, such as straw, tomato vines, potato tops, etc., and a little earth thrown on top. At a meeting of the Board of Control of the Ontario Fruit Experiment Stations, held in January, 1907, it was decided to conduct experiments in budding peach trees upon hardy plum roots. It is hoped that such a practice will help to mitigate the disastrous effects of root freezing.

The Georgian Bay district can grow some varieties successfully, but cannot be considered a safe commercial locality. The factors detrimental to success are (according to Mr. J. G. Mitchell, of Clarksburg): First, distance from market; second, lateness of spring and shortness of season; and third, uncertainty of crop, due to various causes, such as late spring frosts, danger of severe freezing in winter, tenderness of fruit buds, etc.

Mr. W. H. Bunting, of St. Catharines, writes with regard to the peach industry in that district: "While the peach is to some extent a speculative crop and one on which any prospective grower would not be wise to depend exclusively, there is no fruit which is more attractive both from an æsthetic and financial standpoint. In the hands of a careful grower, three or four crops out of five can safely be counted upon in the Niagara district, and this has been greatly exceeded at times under favorable circumstances."

"The principal difficulties in the way of successful peach growing may be stated as follows: (1) *Insect pests*. The peach borer, which annually destroys many thousands of trees; the San Jose scale, which in a very short time will spread over an entire orchard and unless held in check will speedily consign the orchard to the brush pile. (2) *Fungous diseases*. The peach leaf curl, which infests some varieties, notably the Triumph and Elberta more so than many others; peach yellows, a most obscure and fatal disease, and one for which up to the present, notwithstanding the closest investigation, no remedy has been discovered; a disease known as "Little Peach" the above, climatic conditions sometimes result in the loss of the crop through severe winter temperature or late spring frosts.

"The peach industry in Canada has passed through a number of phases during the past twenty-five years, and has run the gauntlet of several severe tests during that time. These have, however, only served to demonstrate the fact that the Niagara District is well adapted to the successful cultivation of this luscious fruit under proper handling and management. An ever increasing market is opening up, and no doubt in the near future larger areas than ever will be devoted to the cultivation of this fruit."

Peaches may also be grown with more or less success in the provinces of Nova Scotia and British Columbia.

As far as the writer can learn, the first peaches for market in Canada were grown at Grimsby, Ontario, about the year 1820 by Mr. Dennis Wolverton, M.P.P. They were mostly natural fruit and were taken to Hamilton market. In 1856, Mr. C. E. Wolverton, who was one of the first and constituent members of the Ontario Fruit Growers' Association, planted five acres of a commercial peach orchard at "Maplehurst," Grimsby, consisting of such varieties as Early Purple, Early Barnard, Mountain Rose, Royal George, Early Crawford, Late Crawford, Morris White, Old Mixon, etc. He was, I understand, the first grower to attempt shipping peaches by express to the different Canadian markets. Within recent years rapid and progressive strides have been made and to-day the peach industry of Ontario is an important factor in the agricultural economics of the Province.

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## BOTANY AND CLASSIFICATION.

At one time the peach was thought to be derived from the almond, but now it is considered as an original species from China. Its botanical name has frequently been changed. Formerly it was known as *Amygdalus Persica*, also as *Persica vulgaris*, but now it is placed in a genus *Prunus* and given the specific name of *Prunus Persica*. *Prunus* is a genus of the order *Rosaceæ*. Some authorities go further and divide the species into two well marked types, the clingstones or paves (P. *Persica vulgaris* of Risso), and the freestones (P. *P. domestica* of Risso).

There are five distinct races of peaches in North America. These were first recognized by Onderdonk, of the U. S. Department of Agriculture, and



by Price, of the Texas Experiment Station. The classification of Onderdonk, which separated the peach into five groups—the Persian, the Northern Chinese, the Southern Chinese, the Spanish, and the Peen-To—has since been adopted, with modifications, by G. Harold Powell, Bailey and others. Mr. Powell (Delaware Bull. 54) substituted in place of the name “Northern Chinese Race” the name “Chinese Cling Group,” which is, as he advocates, in the interest of a more exact and practical nomenclature. A sixth group, the Oriental Bloods, has been mentioned commercially by the nurserymen of the South. A brief description of these different classes or groups is as follows:

(1) The *Persian* includes a large number of varieties most commonly grown in the north, as Crawford, Old Mixon, Salway, etc.

(2) The *Chinese Cling* is mainly characterized by broad-headed, spreading trees with very large flat leaves and large, mostly free or semi-cling fruit, represented by the Chinese Cling, Elberta, Carman, Greensboro, Smock, etc. This group is cultivated in most of the peach regions of the country, but is particularly adapted to the “Cotton Belt” of the South with Northern Florida as the southern boundary of its adaptability.

(3) The *Spanish* or Indian is supposed to have been originated in Florida and the Gulf Coast country as a variation from seed of foreign extraction. It is adapted to the latitude of North Florida. The fruit of this class is very late, firm, and often streaked, and is represented by such varieties as Cabler, Columbia, Galveston, Lulu, Texas, and Victoria.

(4) The *Southern Chinese* or Honey produces oval, long pointed fruits with a deep suture near the base, and includes the parent variety Honey, Climax, Oviedo, Taber, and others; the range of adaptability being from Middle Florida to Middle Georgia and west to the Mexican border.

(5) The *Peen-to* includes the parent Peen-to, which is a flat or tomato-shaped peach, and such varieties as the Angel, Suber, Waldo, and Jewel; cultivated largely in Southern Florida and semi-tropical latitudes.

(6) The *Oriental Bloods* are suited only to Southern latitudes, and comprise varieties with blood-red flesh, such as Red Ceylon and the Japan Dwarf Blood.

## NURSERY MANAGEMENT AND PROPAGATION.

*Selection and Treatment of the Seed.* Before we can raise good peaches, we must raise the trees, and before we can raise good trees we must know how to select and treat the seed. Many growers prefer seed from natural fruit rather than from cultivated varieties, claiming that such is more vigorous and hardy and that the trees are longer lived. While this contention has considerable weight and no mistake is apt to be made by its adoption, yet, there are men who use only the seed from budded trees and with the same degree of success.

Whether selected from natural or cultivated fruits, care should be taken to secure pits that are healthy, of good size, and from ripe fruits. It is better also to obtain the seed from trees of known hardiness and strong growth. Preference is sometimes given to those from yellow peaches, particularly when the seedlings are to be budded with the same colored fruit. Pits from distilleries, or canneries where boiled, are not fit for the nursery as the boiling process destroys their vitality. When it is desired to grow the peach on heavier or moister soil than suits its own roots, the seed of the plum may be used for stocks. In those countries adapted to its growth, the hard-shell sweet almond is used as a stock in very dry soils.

To get an even stand of trees the pits should be stratified in the fall (i.e., mixed with alternating layers of sand in a box, or buried in a fairly dry spot in the garden or orchard) and exposed to freezing and thawing till spring. Or the pits may be kept till near spring, then soaked in water till the shells are well swollen with moisture. They should then be placed in thin layers on the surface of the ground and exposed to the action of frost, being protected from drying by a light covering of leaves or straw. In some sections of the country the seed may be sown in fall or winter directly in the nursery, but by so doing, only a portion will grow and no regularity can be attained in the rows. It is better to treat the seed by stratification, as that will prevent vacancies. In the spring, when taken up, most of the shells will be found to be cracked open; and others may be loosened with a hammer. They are then ready for planting in the nursery.

*Choosing the Site.* The most important requisite in choosing the site for a peach nursery is the selection of a suitable soil. Peach pits will grow in a more or less questionable shape on a variety of soils, but to get the best results, one should select a very light, sandy loam, well-drained, warm, and easy of cultivation. The proper exposure and location should also be considered. The sweep of prevailing winds should be avoided and, in this country, the slope of the land, if any, should be towards the north to retard bud growth in spring and where near large bodies of water the slope should be towards the water. Select also a place that is easy of access, near the road for ease in transporting the trees, and near the house so that the development of the young seedlings and buds may be conveniently watched. A location convenient to a constant water supply is also desirable.

*Preparation of Ground.* The ground for the nursery should be in the form of a square or a parallelogram, and it should be laid out so as to admit of horse cultivation. Strips of land should be left on all sides sufficiently wide to allow a horse to turn about upon. To get the soil in the best condition for the growth of young seedlings, a hoed crop should occupy the land the previous season. A fall plowing is necessary, and ribbing for winter will aid in pulverizing the clods. Another plowing in the spring, and a subsequent harrowing and rolling to smooth the surface, will leave the land in good condition to receive the pits. If the land is not rich enough, apply manure that is well rotted, and on some soils unleached hardwood ashes at the rate of forty or fifty bushels per acre may also be useful.

*Planting the Seed.* Nursery rows should be about three and a half or four feet apart, and laid out as straight as possible. Mark out and plow furrows two or three inches deep, and drop the pits about six inches apart in the drills. With a hoe or rake cover the pits and firmly press the soil upon them. Care should be taken that the seeds do not become dry or mouldy before they are planted.

*Care of Nursery.* The ground should be cultivated as often as is required to keep the weeds down and the soil loose, especially during the early growth of the young seedlings. Hand-hoeing is necessary between the trees in the rows. Where the seed has been sown too thickly, through carelessness or accident, the superfluous trees should be removed. As the season advances, the cultivator should be used less frequently, and when the trees are large enough to shade the ground between the rows it should be stopped altogether.

*Budding.* In Ontario, peach seedlings are budded during August and the early part of September. Budding may be done at any time during the growing season, when the bark peels easily, but in the north late work is necessary to prevent the buds starting into growth that fall and subsequently



being winter-killed. Buds of the desired variety are taken from vigorous growing healthy shoots of the current season's growth. If selected from trees of known worth, as pointed out in the section below, so much the better, as then there is less danger from degeneration, purity being insured, and such a practice tends to breed up rather than down. The upper buds on the shoot are usually discarded, as are also those at the lower end. The remaining portion of the shoot is termed a "stick." The leaf blades on these "sticks" are removed, and the petioles are left to serve as a handle for the buds, which are located always in the axils of the leaves. When the "sticks" are thus prepared they should be placed, butts down, in a bucket of water and covered so as to keep them fresh, and they should be used as soon as possible.

Three persons are required in the nursery to do the work properly—the budder, who should be experienced and an expert, and two boys, one to go ahead and strip the trees of their leaves for six inches above the ground, and the other to follow and tie the bud to the stock. The budder takes a bud from the "stick" and inserts it in a T-shaped incision on the north side of the stock near the ground. The tyer follows and applies a ligature of string or raffia with moderate pressure to hold the bark firmly over the bud. In about two weeks the buds should be united to the stock and the bandage may be removed. The buds should remain dormant until the following spring. When growth begins, the wood above the bud should be removed. Care must be taken to label the rows in the nursery true to name of the variety being propagated.

In the Southern States, June budding is practised by which means a tree sufficiently large for transplanting to the orchard is produced in one season from the seed. In fall budding, it takes two years from the seed or one year from the time the buds start into growth before the tree is ready for transplanting.

*Care of Budded Trees.* Soon after the top of the stock has been cut off, all the natural buds and twigs below the scion should be removed. This should be repeated as often as new buds or twigs appear. All shoots that spring from the roots must also be watched and kept down. Cultivation of the ground should be resumed and continued throughout the growing season. Early in the season a little nitrate of soda may be applied if the growth of the tree is not satisfactory. Summer pruning is practised by many nurserymen and sometimes with advantage. It is not essential, however. Whether it is advisable or not is a matter of opinion. Under another heading we shall consider this question more fully.

*Improving Peach Trees by Selection.* An important factor in connection with the propagation of peaches and other fruit trees, and one that does not receive the attention it merits from fruit-growers and nurserymen, is the question of propagating from bearing trees, and only from trees of known worth. Sufficient attention is not given to the character of the buds and scions used for propagating purposes. This is said to be a reason why so many of the old-time varieties of fruits have "run-out," and why so many good varieties of the present day are degenerating and giving place to new ones.

Nurserymen almost invariably cut their buds and scions from young trees not yet in bearing. This practice develops a tendency in our fruit trees to run too much to wood at the expense of fruit. By following it, we cast aside the elementary principles of plant improvement; we fail to take advantage of a simple principle that was practised, though unconsciously, by the plant growers of a hundred years ago, viz., selection from the best.

Many of us fail to appreciate the fact that fruit buds tend to vary. We know that distinct new varieties have arisen by bud variation, but we are not sensible to the possibility of a lesser bud variation—a variation or departure from the type which, though, perhaps, small at first, may eventually change the entire character of the variety that we are propagating. This change may be for better or for worse. The usual tendency is to degenerate or revert to the wild or natural species from which the variety originated. How important, then, is the question of propagating from trees that have borne fruit—trees of whose productivity and worth we are well acquainted.

Wood for propagating purposes, whether for budding, grafting, or making cuttings, should be selected as carefully from trees and plants of the ideal type as if we were selecting seeds. The principle of variation is as great in fruit buds as in seeds, or even in live stock. By applying this principle, and applying it in the fruit nursery, we will tend to breed up rather than down.

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### HOW TO START AN ORCHARD.

*The Location.* The selection of a suitable site for a peach orchard is most important. Although a problem which involves numerous and various difficulties, it is deserving of due and careful consideration by all intending planters. Opinions among growers of experience differ widely in regard to the best location, the best site, the best slope and the best exposure for a plantation of peach trees. It is obvious, then, that no direct rules can be laid down. We shall, however, mention a few general principles to indicate the proper course to pursue.

In the first place, it is important to locate the orchard near a good market or within reach of good transportation facilities. If two or more means of shipping are within reach, they would make the situation all the more desirable. Also select a place where plenty of help can be secured when required to harvest and market the fruit.

Probably the chief requisite in choosing a location is a situation that is, as far as possible, immune from frosts. Narrow valleys and depressions of any kind are not desirable. These form receptacles in which the cold air collects, as cold air, being dense and heavier than normal or warm air, settles to lower levels. This drainage of the atmosphere occurs only on still nights and under the most favorable circumstances. Another important subject of inquiry in locating an orchard and one akin to the preceding is the proper elevation. As low depressions are unsafe and very high elevations colder than comparatively low ones, it is not always the absolute elevation, but rather the relative elevation, of the site that must be considered.

The adaptability of a region in Ontario for peach growing depends also upon its proximity to large bodies of water. In no part of the world, perhaps, is the ameliorating influence of large bodies of water more distinctly marked than in those counties fringing on the Great Lakes. The limit of the boundary of the area over which the effects of these lakes are felt to be of economic importance depends largely upon the degree of the slope away from the water. Lands that gradually slope away from the lake feel the advantage of its proximity much farther than those lands that rise abruptly.

The exposure or aspect of the land must also be considered when deciding upon the location. A northern exposure retards the swelling of the buds which often occurs during warm spells in spring. A southern exposure gives earlier results and better colored fruits. Near large bodies of water the best slope is towards the water. Planting on the lee side of hills and



forests is also an advantage. All these points and many others should be looked into before arriving at a definite conclusion.

Difference in climate and soil, as well as innumerable local conditions unthought of and consequently unprepared for, tend to increase the difficulties met with in choosing a suitable site. Therefore, we must study closely local environments, we must profit by the experience of others, and we must use sound, firm judgment if we are to ascertain, with any degree of success, the proper location and exposure for a peach orchard. As a general statement, it is quite safe to say that a relatively high elevation and a northern exposure increase the probability of immunity from frosts and, as a consequence, afford the best location for an orchard in this Province. With, in addition, the Great Lakes nearby and the possibility of artificial protection by means of wind-breaks, and by no means least, the probability of securing more hardy varieties through careful selection of seedlings and scions from northern grown fruits, there is no apparent reason why the peach growing area of Ontario cannot be appreciably enlarged.

*Wind-breaks.* The importance of wind-breaks, in their relation to horticulture, is being recognized more and more as the art of fruit growing

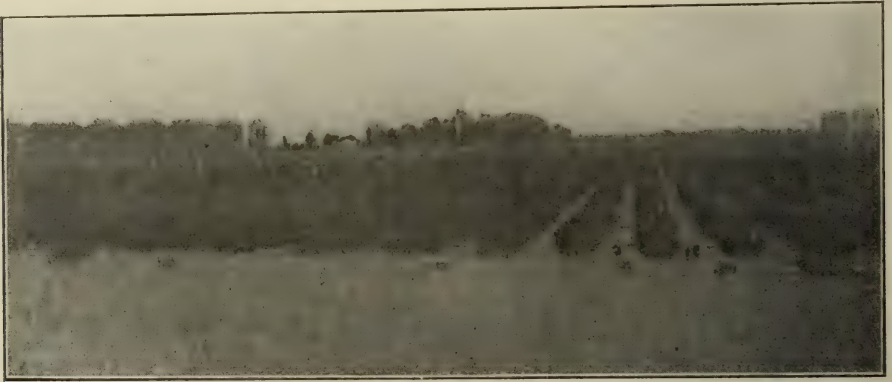


FIG. 1. Young peach orchard, owned by Mr. J. L. Hilborn, Leamington, Ont. Trees two years old, previous to freeze of 1904.

advances. While there are a few who directly oppose them, yet it is safe to say that the greatest difference of opinion exists in connection with minor details rather than with the main question of their importance as a whole. In this short article, we shall not attempt to discuss the value of wind-breaks, but shall devote the space to a few remarks upon their construction.

For interior regions, a wind-break that is dense and hedge-like—with trees closely planted—is the most desirable. For districts situated near large bodies of water, one less dense is to be preferred. The relative denseness of wind-breaks depends upon the kind of tree used, the number and distance apart of rows, and the number of trees in each row. When two or more rows are planted it is well to have the trees in one row occurring alternately with those in the next.

Almost any strong-growing tree will do to make the wind-break. For heavy wind-breaks and for winter protection the coarser evergreens are best. In Canada and the Northern States, the Norway spruce is the evergreen most frequently employed. Austria, Scotch, and native pines, have also proven quite satisfactory. For light wind-breaks, deciduous trees are used. Among the best of those for the purpose are maples, elms, and Lombardy poplar. In some districts, and in fact, as a rule, a wind-break consisting of both coniferous and deciduous trees is the most serviceable.

*The Soil.* Many horticulturists and orchardists say that the peach is partial to only one kind of soil; others claim that it is adapted to different kinds, but particular kinds; and others again think that it will thrive on a great variety of soils, from light sand to heavy clay. We read of peaches growing in Michigan on drifting sand dunes; in Florida, on light pine sands; in Arkansas, on thin chocolate sands; in New England, on stony land and poor gravel; in Delaware and New Jersey, on light sandy loams; in parts of Ontario, on sandy loams; in Texas, on heavy, black loams; in West Virginia, on black soils of limestone origin; in Kansas, on black prairie soils; in parts of New York, on clay loams; and in Georgia, on stiff red clays. These are some of the peach soils that we read and hear about, and sometimes see. They must not be taken, however, to indicate the representative peach soils of the places named, as probably some of them refer to special and isolated cases.

When in Georgia, I observed that the so-called and much-talked-of red clays of the Georgia "peach belt" were only clayey in appearance and texture when wet. In this observation we were not alone. Many men, better informed in the matter and better fitted to express an opinion, supported us, going as far as to say that these soils, the so-called red clays, are in reality red sands. To verify these impressions, two samples were secured and taken to the Ontario Agricultural College, Guelph, and personally analyzed by the writer. The one purpose of the analysis being, as intimated, to obtain a correct definition for the soil. This red clay, it should be noted, constitutes the subsoil. The surface soil—six or eight inches deep—is composed of light gray sand with an occasional cropping out of the red soil from beneath. Two samples of this gray surface soil were also secured for analysis.

The results of the analyses show that the red "clay" of both samples, is made up of 85 per cent. sand and silt, indicating that it is in reality a light sandy loam. The surface soils both proved to be mostly sand, one analyzing 97 per cent., and the other about 91 per cent. sand and silt. Probably the clayey nature of the red soil is due to the presence of iron oxide, which in sandy soils is known to act as a cementing material. Although the analyses of these samples from Georgia have no direct bearing on the selection of peach soils in Ontario, they indirectly influence our notions of these things in two ways: first, by confirming the general impression that peaches require soils of sandy character; and second, by pointing out the fact that popular definitions are often far from exact.

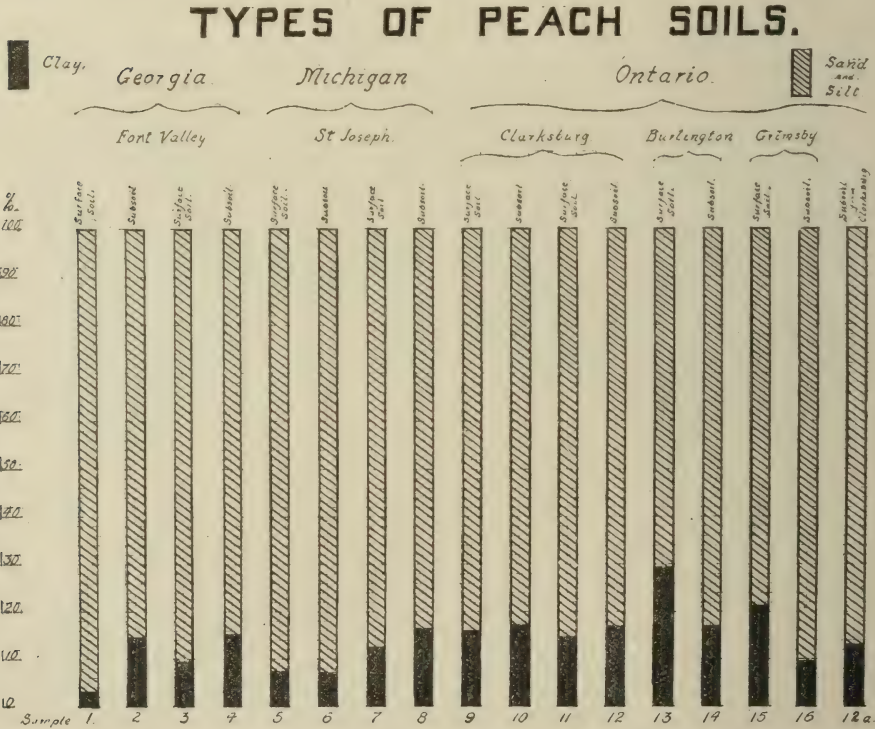
The information gained in these mechanical analyses, led us to continue the work. A number of samples of surface and subsoils were secured from various peach sections; four from Michigan, and a dozen or so from different places in Ontario. A mechanical analysis was made of each with the purpose, as before, of defining the sample and of comparing the results. A short account of the work done with results may be found in the following section of this article.

As a general statement, it may be said that the best peach soil is a deep sand. Upon such soils, there is less wood growth at the expense of fruit, and the wood matures earlier in the season. Next to sandy soils are the light loams. Heavier soils induce late wood growth. All peach soils must be light, warm, deep, and well-drained. Mr. S. H. Rumph, of Marshallville, Ga., said to the writer: "On the prospective site, dig a hole five feet deep, leave over night, and if water runs into it, move on to some other locality." This advice is well worth noting, as probably the most essential feature in a peach soil is dryness; not too dry,—it must be retentive of moisture,—but rather dry than moist.



*Mechanical Analyses of Soils.*—Peach soils are by popular custom often erroneously defined. We read of peaches growing on soil of all types and conditions. A few of these are mentioned earlier in this article. As stated there, we thought it of interest to secure a number of samples for analysis; four were got in Georgia, four in Michigan and nine in Ontario. Each sample was separated by a definite method into different sized particles and by determining the percentage of soil grains over one-thousandth of an inch in diameter, a correct definition was secured. The following table was used as the basis for defining the samples

90 to 100	per cent.	greater than	$\frac{1}{1000}$	of an inch.....	sand.
75	"	90	"	"	light sandy loam.
60	"	75	"	"	sandy loam.
40	"	60	"	"	loam.
25	"	40	"	"	clay loam.
10	"	25	"	"	clay.
0	"	10	"	"	heavy clay.



Diagrams of soils analyzed, showing relative percentages of sand and clay. Odd numbers represent surface soils, and even numbers, subsoils.

DESCRIPTION AND DEFINITION OF SAMPLES ANALYZED.

- No. 1. Surface soil from Fort Valley, Georgia, *Sandy soil*, containing 97.05 per cent. sand and silt. Brown. From virgin forest, adjoining orchard from which No. 3 was taken.
- No. 2. Subsoil from Fort Valley, Ga. *Light sandy loam*, containing 85.75 per cent. sand and silt. A very deep red. Very tenacious, evidently due to the presence of iron oxide. From orchard of young trees.

No. 3. Surface soil from Fort Valley, Ga. *Sandy soil*, 90.62 per cent. sand and silt. Light brown. From orchard of known worth recently in fruiting trees and now growing young trees of first class vigor and health. Built up by commercial fertilizers and cow peas.

No. 4. Subsoil from Fort Valley, Ga. *Light sandy loam*, 84.65 per cent. sand and silt. Red. Composed of large and small lumps, but under microscope separate structure predominates; lumps probably due to cementing property of iron oxide. Similar in most respects to No. 2, differing only in being lighter in color. From record breaking orchard of Elbertas.

No. 5. Surface soil from St. Joseph, Michigan. *Sandy soil*, 92.40 per cent. sand and silt. Brown, with slight tint of red. Incumbent upon subsoil No. 6. From orchard five years old, fertilized exclusively with barnyard manure.

No. 6. Subsoil from same place and orchard as No. 5. *Sandy soil*, 92.65 per cent. sand and silt. Light orange. Under microscope particles appear rounded, apparently coated with iron oxide.

No. 7. Surface soil from St. Joseph, Michigan. *Light sandy loam*, 87.55 per cent. sand and silt. Dark brown. Incumbent upon No. 8. From orchard twenty years old, fertilized exclusively with barnyard manure.

No. 8. Subsoil from same place and orchard as No. 7. *Light sandy loam*, 83.65 per cent. sand and silt. Dark gray, with faint tint of red. Particles rather coarse and showing presence of iron, but not so evenly rounded as those in No. 6.

No. 9. Subsoil from Clarksburg, Ontario. *Light sandy loam*, 84 per cent. sand and silt, rather fine in grain. Brown. Incumbent upon No. 10. From land thirty years in farm crops and five years in bearing peaches, fertilized by barnyard manure.

No. 10. Subsoil underneath No. 9. *Light sandy loam*, 82.5 per cent. sand and silt. Brown. Taken from four inches deep, too near the surface. Practically the same as No. 9.

No. 11. Surface soil from Clarksburg, Ontario. *Light sandy loam*, 85.5 per cent. sand and silt. Brown. Apparently same as No. 9. From land thirty-five years in farm crops, fertilized by barnyard manure.

No. 12. Subsoil underneath No. 11. *Light sandy loam*, 82.5 per cent. sand and silt. Same as Nos. 9, 10, and 11.

No. 13. Surface soil from Burlington, Ontario. *Sandy loam*. 70.85 per cent. sand and silt. Brown. Incumbent upon No. 14. From orchard twelve years old, fertilized with wood ashes.

No. 14. Subsoil underneath No. 13. *Light sandy loam*, 83.20 per cent. sand and silt. Reddish brown. Quite similar in appearance and texture to No. 13.

No. 15. Surface soil from Grimsby, Ontario. *Light sandy loam*, 78.5 per cent. sand and silt. Brown. Many coarse particles and probably some gravel. Typical peach soil of the section. Last fertilized five years ago with wood ashes.

No. 16. Subsoil underneath No. 15. *Sandy soil*, 90.5 per cent. sand and silt. Red brown. A more even soil than No. 15, and with finer particles.

*Extra:*

No. 12 (a). Subsoil from Clarksburg, Ontario. Selected from two feet deep on same farm as Nos. 9, 10, 11, and 12. *Light sandy loam*, 87 per cent. sand and silt. Brown.



*Selection of Varieties.* When starting an orchard, one must first choose the location and soil and then decide upon the varieties to be planted. To give advice upon this point is a difficult problem. Various factors must be taken into consideration. With some men, personal preference largely influences the success of the venture. Local conditions of soil and climate must be studied and varieties chosen that are best adapted to such conditions. Planters should have some purpose in view, some particular market to be filled and select accordingly. Inter-pollination should also be considered; while this is not so important in peaches as with some other kinds of fruits, yet it is safer never to plant an orchard of one variety alone. These are general pointers.

To be more explicit, select varieties with reference to adaptation, hardy and suited to your soil; to productiveness, not shy bearers; to health, as some varieties are more subject to some diseases than others; to vigor, and



FIG. 2. Ruddy-cheeked, golden Elbertas in picking basket and "cups."

save the plant doctor's bill; to season of ripening, late or early; and to early bearing and longevity,—worth considering, but not essential in the case of peaches. Among the qualities to be decided upon with reference to the fruit of the peach, we have appearance, size, color, freestone or clingstone, white or yellow flesh, flavor, texture, firmness, thickness of skin, and keeping qualities.

The number of varieties that one should plant will depend upon the markets to be supplied and the method of marketing. When catering to both local and distant markets, plant varieties to ripen early and late so as keep up a full supply of marketable fruit from the beginning to the end of the season. When large shipments in refrigerator cars are in prospect, select varieties that will ripen at or near the same time so as always to have sufficient fruit to fill the car, or better still, plant enough trees of one variety for a particular season, as varieties behave differently in cold storage. The fundamental principle in choosing varieties is to profit by the experi-

ence of our neighbors, to observe the behavior of varieties growing under conditions similar to your own, and to be governed accordingly.

The uncertainty of varietal names is a matter that requires particular attention. New varieties, or, rather, new varietal names, often spring into existence from the mind of some nurseryman or fruit grower. Every season new varieties are offered for sale which, in some cases, are nothing more than old varieties with new names. These impositions may be charged to one of two causes: a direct attempt to defraud the public by substituting a new name for an old one, or a less direct attempt at fraud through the loss of the original name and subsequent substitution. Neither cause is excusable. Besides this substitution of names, the planter of new varieties should remember that wide variations are found in many well-established varieties, also distinct strains. Crawford's Early and many other varieties of peaches are known to exist in distinct strains, differing in size, shape, color, season of ripening, quality, and productiveness. These varieties are probably due to bud variation and subsequent propagation, and should be borne in mind when making a selection.

#### COMMERCIAL VARIETIES RECOMMENDED BY PROMINENT GROWERS IN EACH PEACH DISTRICT OF ONTARIO.

*J. W. Smith, Winona.*

*General list in order of ripening:* Alexander, Early Rivers, Hale's Early, Yellow St. John, Early Crawford, Fitzgerald, Late Crawford, Elberta, Longhurst, Crosby, Smock.

*For long distance shipping:* Yellow St. John, Early Crawford, Elberta, Smock.

*Hardy:* Crosby, Longhurst, Lemon Free, Alexander, Early Rivers.

*For canning:* Yellow St. John, Mountain Rose, Early Crawford, Garfield, Elberta, Late Crawford, Smock.

*For evaporating:* Longhurst, Lemon Free, Smock.

*W. W. Hilborn, Leamington.*

*General list in order of ripening:* Alexander, St. John, Garfield, Early Crawford, Fitzgerald, New Prolific, Engol Mammoth, Elberta, Golden Drop, Bronson, Kalamazoo, Smock, Banner.

*For long distance shipping:* Early Crawford, Garfield, New Prolific, Elberta, Engol Mammoth, Golden Drop, Bronson, Smock, Banner.

*Hardy:* Alexander, Fitzgerald, Barnard, New Prolific, Crosby, Tyhurst, Longhurst, Lemon Free, Golden Drop, Banner.

*For canning:* St. John, Garfield, Early Crawford, Fitzgerald, New Prolific, Barnard, Engol Mammoth, Old Mixon, Mountain Rose, Crosby, Golden Drop, Lemon Free, Banner.

*For evaporating:* Garfield, Early Crawford, Barnard, New Prolific, Elberta, Golden Drop, Longhurst, Lemon Free, Smock.

*J. G. Mitchell, Clarksburg.*

*General list in order of ripening:* Triumph, Champion, Red Canada, Fitzgerald, Tyehurst, Early Crawford, Elberta, Bowslaugh's Late, Late Crawford.



*Hardy*: Triumph, Fitzgerald, Tyehurst, Bowslaugh's Late.

*Canning and evaporating*: St. John, Early Crawford, Reeve's Favorite, Elberta, Longhurst, Late Crawford, Smithson, Smock.

*W. H. Bunting, St. Catharines.*

*General list in order of ripening*: Yellow-fleshed—Triumph, St. John, Early Crawford, Brigdon, Fitzgerald, Foster, Reeve's Favorite, Chair's Choice, Elberta, Globe, Late Crawford, Smithson, Smock. White-fleshed—Alexander, Greensboro, Champion, Old Mixon Free.

*For long distance shipping*: Early Crawford, Reeve's Favorite, Elberta, Old Mixon, Globe, Late Crawford, Smithson, Smock.

*Hardy*: Triumph, St. John, Fitzgerald, Crosby, Longhurst, Smock.

A glance at these lists shows a marked partiality for varieties of yellow flesh. The same tendency is prevalent throughout the entire peach growing section of this Province, and is due largely to the popularity of the Early Crawford peach for canning purposes. While a pardonable failing, in that some yellow fleshed varieties are as desirable, if not more so, for special purposes than some white ones, yet, from a dessert standpoint, it is entirely without substantial grounds and should be amerced. It is somewhat, however, a matter of personal taste and opinion. One market seems to favor flesh of one color and another something different. The English markets, as well as many cities in America, especially Philadelphia, prefer peaches with white flesh; other markets, as New York and Toronto, favor those of yellow flesh. There is no real foundation for preferring one more than the other. For dessert purposes there are just as good peaches with white flesh as with yellow and vice versa. In fact, the flavor and quality of many of the white ones is superior to the best of the yellows.

In the great peach state of Georgia the leading varieties grown for the northern markets are white fleshed, with one notable exception, the Elberta. Here are a few well worth being adopted by our peach men, if they prove adapted to our soil and climatic conditions: Greensboro, Waddell, Carman, Hiley, Thurber, and Belle of Georgia. These are arranged in order of ripening. All have white or creamy flesh and are free or partial free-stones. Hiley and Thurber are excellent shippers and of fine appearance; the latter ripens just before the Belle of Georgia, which immediately precedes Elberta, and is the best peach of its season for commercial purposes. Hiley was awarded the Wiley medal at the second last meeting of the American Pomological Society at Boston, a most worthy distinction, this medal being given only to one new fruit each year. It certainly is a handsome peach, highly colored and showy, and ripens just before Thurber.

*Selection of Suitable Trees.* Having decided upon the varieties to be planted, the next thing is to secure trees of those varieties that will give the best possible results. In the first place, the trees must be true to variety type and not older than one year from the bud. Large trees are not always the best; medium sized ones are usually more satisfactory to plant. Whether large or small, they should be healthy, thrifty, smooth and well grown, but not spindly. They should possess good roots and be free of bruises, fungi, and injurious insects. It is best to avoid trees grown in districts subject to peach yellows, peach leaf curl, and the San Jose scale. To secure these desirable features in the trees, it is advisable to have a written agreement with the nurseryman to that effect. Allow no substitution of varieties and

reject all inferior stock. Trees for northern regions should be from a northern nursery. When convenient to a nursery, it is well to inspect the stock and buy direct from the nursery rows.

*Preparation of the Soil.* The best method of preparing the soil for peach growing is to grow a preparatory crop for one or two seasons before planting out the trees. On very rich lands, the best crop of this kind is one that will take the excess of nitrogen out of the soil and one that may be cultivated to improve the physical condition of the soil. Poor, worn-out land had better be sown to clover or some similar green crop for plowing under. If time is limited and previous cropping cannot be done, the preparation of the soil as it stands should be most thorough and complete.

All stumps, roots, stones, or other obstructions should be cleared off the land. Subsoiling is necessary when the land has a hardpan stratum resting immediately underneath the surface. All wet spots or pockets should be well under-drained, as well-drained land is an imperative necessity for successful peach culture.

The ground should be broken early in the fall to a depth of about six or eight inches. Fall cultivation should be practised to thoroughly pulverize the clods and rot the sod, and then the land should be ribbed up for winter. This is done to assist drainage, and thereby enable the land to dry off quickly early in the spring and to permit the frost to further pulverize the soil. As soon as the soil warms up in the spring, the ribs should be worked down and the land well cultivated.

*Preparation of Trees for Planting:* Before planting in the orchard, the ragged and bruised roots of the trees should be cut off to prevent rotting. This should be done smoothly with a sharp bladed knife so that the wounds will callous and heal rapidly. The tops also should be pruned back to correspond to the roots that are left, if not more severely so. Pruning back to whips is generally practised with peach trees, particularly in southern countries. A modification of this is practised in the north, each tree being pruned by cutting off all the side branches to stubs with a single bud at the base of each. The top of the tree is cut off at a distance from the ground corresponding to the length of the trunk desired for the tree. This is best done, perhaps, after the trees are set so as to have them uniform.

There is a great diversity of opinion among growers as to the proper height at which to start the head. In Canada the usual height is not less than three feet, but in the south and many of the northern states 12 to 18 inches is regarded as the best. In Ontario the relatively high head is adopted on account of the fact that the fruit is thought to ripen better on high heads, and because it is easier to cultivate the land close to the trees. While the contention that the fruit ripens better may be true, yet it has not proved to be true in the orchards of the northern states. Why should it be true in Ontario? We have yet to learn of any definite experimental data that confirms this contention.

The advantage in ease of cultivation is more worthy of consideration as the expense of working the orchards is sometimes increased by having to dig the spaces around the trees which cannot be reached by the plow or cultivator when the head is low. This extra expense can be done away with, however, by the use of up-to-date implements, adapted and made especially for this kind of orchard work. Such a machine is found in reversible cut-away orchard plows and in various extension disk harrows that are made in Canada and elsewhere.

Low-headed orchards may be worked also by plowing in spring as close to the trees as possible and then using an ordinary low spring-tooth harrow



to level this and to loosen the soil near the trees that cannot be reached with the plow. A harrow must be used that has two sections, and these sections should be extended or separated by means of a wide "evener" or "spreader" fastened between them. The width of the spreader will depend upon the distance between the plowed area and the trunks of the trees. On very light soils, a smoothing harrow may be used instead if adjusted in a similar manner. Another means of working under low-headed trees is the use of a plow followed by an ordinary plank drag. Plow as close to the trees as possible, then use the drag by driving zig-zag around and between the trees.

Some important advantages are gained by adopting low heads. The trunk of the tree is protected from the heat of the summer's sun and from sunscald in winter. A low head will stand a storm better and less attention need be given to wind-breaks for the orchard. But the advantage of most moment, and one, that to my mind, outweighs all the good features claimed for a high head, is that the fruit can be picked from the ground, no ladders being required for that purpose. In large orchards, and especially in seasons of abundant crops, and when labor is scarce as it is to-day in Ontario, this feature adequately compensates for the extra expense of cultivation, if any, and for what some growers claim may be lost through the tardy ripening of a few fruits on the lower branches.

In connection with trimming trees to whips and starting low heads, a close method of root-pruning, known as the Stringfellow method, has been widely practised and discussed, particularly in the state of Texas. The method consists in cutting off the roots to mere stubs an inch or two long and cutting back the top with corresponding severity. Although Mr. Stringfellow says: "It applies to trees of all ages, everywhere, and the larger the tree the more necessary it is to root prune," it has not proved desirable in the north, especially in the heavier soils and with large trees. It is advisable, therefore, to let well enough alone and allow the other fellow to do the experimenting.

*Planting.* Peach trees should be planted 20 by 20 feet apart, if the soil is in good condition. Some varieties require more room than others; e.g., the Elberta needs more space than the St. John as its habit of growth is more spreading. Where the soil is poor and the variety upright in growth, the trees may be planted closer. In an orchard of many varieties, it is best to choose one distance apart for all so that the long rows of trees will be in perfectly straight lines. Usually the greatest mistake in planting is in the matter of crowding. This should be avoided so as to admit of sufficient root room for the trees; also, to facilitate the operations of spraying and harvesting, to admit the sunlight and to allow of good cultivation.

The time for planting in Ontario is in spring, as early as the ground is fit to work. Planting at this time is generally considered safer than planting in the fall, as the dangers of winter-killing and heaving of the trees are averted.

There are many systems of arranging trees in the orchard, the most common of which are the square, the rectangular and the hexagonal. The simplest of these is the square system by which 108 trees, 20 feet apart, may be planted on an acre, each four adjacent trees forming a square, the rows being the same distance apart each way. Under ordinary conditions, peaches, being comparatively short-lived and not very large trees, are best planted by this method. When closer planting is desired, a better way is to plant on the rectangular system, and remove every other row of trees when they become crowded. By this method the rows are farther apart one way than the other. For instance, instead of planting 20 by 20, plant at first 12 by

6 feet and secure one or more crops from the trees when closely planted, and as soon as they begin to crowd take out the 12-foot row, leaving the trees 16 by 24 feet apart, by which distance there would be left 113 trees per acre. This method of planting is an excellent one when properly carried out. It is a dangerous one, however, for the majority of orchardists to follow as it is only the few who have the will and the heart to cut down strong vigorous trees in the prime of productiveness.

The hexagonal system is a little more complicated than either of the preceding but allows of 15 per cent. more trees to the acres without any more crowding. In this system the adjacent trees form a hexagonal figure, enclosing one tree in the centre. The trees in one row alternate with those in the next, thus forming a system of equilateral triangles. This plan may be used for peaches with advantage, but is best suited for trees of larger size such as apple orchards.

On very hilly lands, and especially where the soil is sandy and apt to be washed by rains, the rows should be laid off at water level. No regular system can be followed other than to plant horizontal lines on the sides of the ridges. In case the lines separate widely, short additional rows may be inserted to utilize the space.

To stake out an orchard on the square or rectangular plan, furrows and cross furrows may be drawn and the trees planted at the intersections. This method is only applicable to level land. A more accurate plan is to lay off the orchard by means of stakes and a long wire. The wire is stretched along one side with the ends attached to stout stakes. The desired distance apart for the trees is marked on the wire and a stake is placed at each mark to indicate the position of the tree. One of the ends is laid off at right angles in the same way and the intervening stakes are also set by means of the wire.

In the hexagonal system, the first row is staked out in much the same manner. To locate the trees at the ends of the second, the distance apart of the trees in the first row is taken as a base upon which to erect an equilateral triangle, the apex of which gives the required position. The row is then staked out as before.

For all these plans, sighting also is necessary to accurately place the stakes in line. At regular intervals, alleys and cross alleys should be made by leaving out a row of stakes. By so doing, the orchard will be laid out in blocks which will greatly facilitate labor in harvesting. There should be only one variety to a block, and all blocks of the same variety should be planted together. The orchard is now ready for the actual planting.

When the trees are brought from the nursery, the roots should be covered with wet sacking to avoid exposure to sun and wind. If they have not already been trimmed and prepared for planting, as suggested under the previous heading, it should be done at this time. At each place designated by a stake, a hole should be dug large enough to allow a full spread of roots, and deep enough to allow a few shovelfuls of rich surface soil on the bottom.

For planting small orchards, a planting board may be used to place the trees on the exact spot marked by the stake. This board is about five feet long with holes in the end and a notch in the centre. The notch is placed around the stake, wooden pins are driven into the soil through the holes in the ends, the board is removed, the stake lifted, and the hole is dug. A tree is then dropped into the hole, the board is again put in position over the wooden pins and the tree takes the place of the original stake in the central notch. This is a good method for small plantings but has no place in the work of large commercial orchards.



In setting out large plantations, a tree is planted at each end of the row, others in the centre and at intervals along the row, and, by sighting, the intervening trees are easily put in line. Two persons are needed in planting the trees, one to hold the tree and tramp the earth firmly about the roots as fast as the other throws it in. The tree should be set deep enough to place the union of the stock and bud a couple of inches below the surface of the soil. In very light soils, the peach may be planted deeper than on heavier soils. While the peach is a shallow-rooted tree and should be planted not too deeply, yet too shallow planting should be avoided, mainly to prevent the danger of washing and consequent exposure of the roots and crown; and because, on shallow-rooted trees, borers are more troublesome, as they are apt to work down underneath the roots where they cannot be reached. Too deep planting also should be avoided, as peach roots require plenty of air and are very sensitive to smothering.

On very thin soils, a handful or two of bone-dust, ashes, or some ammoniated fertilizer, mixed with the earth in the hole, may be beneficial. As soon as the orchard is planted, a record of the planting should be made, giving names and locations of varieties, names of nurserymen if trees have not been raised at home, and other bits of information for future reference.

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### ORCHARD CULTURE AND CARE.

*Inter-cropping.* Many of the leading peach growers, and some of the best writers on horticulture, advocate clean cultivation from the start for peach orchards. On the other hand, we occasionally hear of extreme cases of non-cultivation. The former is decidedly the more preferable practice, especially on light, sandy land. Happily, however, one is not required to choose either method, as between these two extremes there is a happy medium.

Cropping is allowable in a young peach orchard, if suitable crops are grown, but it should be discontinued after the third year, at the latest. Cropping gives a return from the land until the trees begin to pay for the cost of cultivation. The growing of grasses and grains should be condemned; even clovers, except for cover crops, are undesirable as they prevent cultivation. No crop should be grown that requires late tillage or late stirring of the soil at harvest time. Potatoes are objectionable for this reason. Strawberries and bush fruits should not be grown in a peach orchard; the former do not permit of good cultivation at the right time in the season, and the latter needlessly take up room as they do not bear more than a crop or two before the proper time to cut them out. Corn exhausts the soil and is not well adapted to those soils best suited for peach culture.

The best crops for this purpose are those which may be hoed and cultivated until mid-summer, and at the same time do not draw too severely upon the fertility of the soil, nor encroach upon the trees. A partial exception to this rule, however, is the practice of growing fillers until the trees commence to crowd. This was noted under the heading of planting in connection with our remarks on the rectangular system and is nothing more than a modified plan of inter-cropping. As one good crop of peaches will pay for the previous care of the orchard, this plan alone without additional inter-cropping is most commendable. Beans and peas are among the desirable crops for a peach orchard, as they are not very exhaustive and require thorough tillage. Small vegetables and tomatoes are favored by some orchardists and many other crops that meet the aforesaid requirements.

*Cultivation.* The land in a peach orchard should be thoroughly tilled every season from early spring till the middle of July or first of August. Each tree readily respond to good cultivation. Some growers throw the soil alternately to and from the trees; however, the level cultivation is to be preferred. This cultivation should be done every two weeks or so and as soon as possible after every rain. In young orchards it should be more or less deep to induce a downward growth of the roots. In bearing orchards, shallow cultivation is the rule, and perhaps is best for the immediate benefit of the orchard; but it is thought, by some authorities, to be one of the causes of the short life of modern peach trees. Moderately deep tillage is not harmful, to say the least.

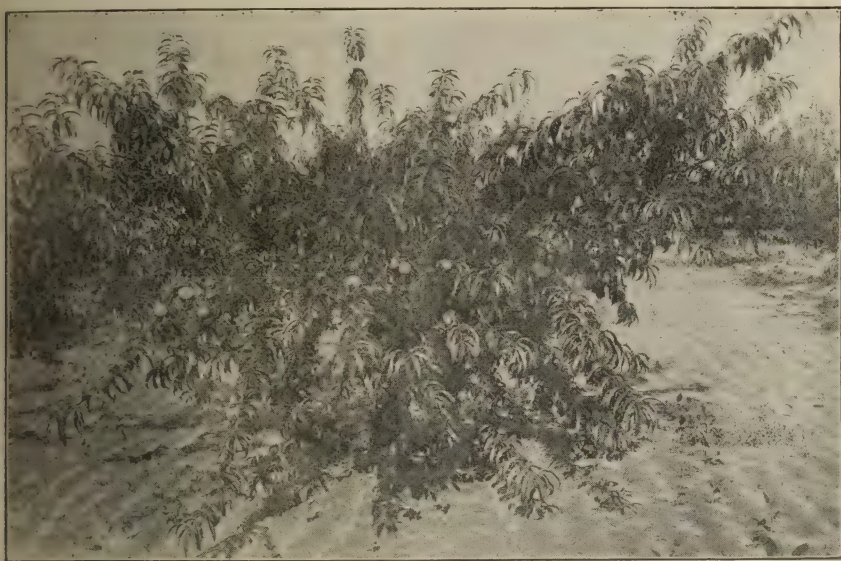


Fig. 3. Clean cultivation in the Hale orchard of low-headed trees (Belle of Georgia, 4 years old).

Spring cultivation should be fairly deep and, as the season advances, it may become shallower and lighter. About mid-summer, when the wood of the trees is nearing maturity for the season, cultivation should cease altogether. At the last cultivation, a cover crop may be sown. Although high culture and particular attention is required in the peach orchard, it can be overdone and result in an over-abundance of wood growth. Such a condition is brought about by intense and late tillage on strong, rich land.

We have not the time or space to undertake a discussion of the principles of tillage. To give us a keener appreciation of its worth, however, and to enable us to apply our knowledge more intelligently, it may be well to note briefly the benefits of the operation. The following summary is based upon and similar to the one systematized by Bailey in the "Principles of Fruit Growing":

1. Tillage improves the physical condition of the land,
  - (a) By fining the soil, and thereby presenting a greater feeding surface for roots;
  - (b) By deepening the soil, and thereby giving a greater foraging area to the plant;
  - (c) By warming and drying the soil in spring; and
  - (d) By reducing the extremities of temperature and moisture.
2. Tillage helps to conserve soil moisture,
  - (e) By increasing the water-holding capacity of the soil;



- (f) By checking evaporation; and
- (g) By destroying weeds which appropriate moisture.
- 3. Tillage helps to render plant food available,
- (h) By admitting oxygen;
- (i) By promoting nitrification;
- (j) By directly liberating plant food; and
- (k) By hastening the decomposition of organic matter.
- 4. Tillage helps to hold in check insect and fungous enemies.
- 5. Tillage is of more than usual benefit to peach trees during the season following winter injury. (Mo. Exp. Sta. Bull. 55).

*Implements.* The number and nature of the implements required for a peach orchard depend much upon the kind of soil and the method of cultivation to be practised. Among the most useful for general use are: One horse scuffer, for working around young trees; disk, cutaway, Acme and smoothing harrows; spring-tooth cultivator with set of wide blades; ordinary steel plows and an extension plow for getting up close to the trunks of low spreading trees; roller, orchard wagons, etc. Short whiffletrees with no projecting hooks, and harnesses with low collars and hames and no turrets, must be used to avoid injury to the trees. Various kinds of small tools, not necessary to mention, will be required, besides pruning and spraying apparatus.

*Fertilizers and Manures.* In a general way it may be said that the most essential elements of plant food for fruit orchards are nitrogen, phosphoric acid and potash. The proportion and amount of these that should be applied varies with the different kinds of fruit. For the peach, plenty of potash and phosphoric acid is required and only small quantities of nitrogen. The proportion and quantity required for a particular orchard will vary with the texture and condition of the soil and the amount and condition of availability of the plant foods it already contains. The only way to determine the wants of the soil is to experiment and note the results.

An over-supply of nitrogen is ruinous to peach trees. It has been found that: "The peach is healthiest and yields the best fruit in soils which for most crops would be considered deficient in nitrogen." Also, that trees suffer from winterkilling when overfed with nitrogen, are more liable to be infected with brown rot, and produce later and poorer crops of fruit. It is obvious, then, that one must be cautious when using nitrogenous fertilizers.

A liberal application of nitrogen is important, however, for young growing trees, and also for mature trees when the leaves appear smaller than natural and take on a yellowish color. Although this condition of the leaves usually indicates a lack of nitrogen, it also may indicate the presence of excessive moisture in the soil. Too much nitrogen is indicated by unusually dark green foliage, rank growth, large crops of small poorly colored fruit or no crop at all, and immaturity of the wood in fall. When this fertilizer is required to stimulate early growth or restore impoverished bearing trees, it is most effectively applied in the form of nitrate of soda. Another commercial form of nitrogen is sulphate of ammonium. This also may be used for peaches, but it is not so quick in its action as nitrate of soda.

The most economical method of furnishing nitrogen is by means of tillage and green leguminous manures; the former promotes nitrification; the latter indirectly adds nitrogen to the soil from the air and it also prevents the leaching of nitrates already in the soil. On poor, gravelly knolls some commercial form of nitrogen may be used with advantage, and it should be applied early in the season as late applications tend to prevent a proper ripening of the wood for winter.

Phosphoric acid in some commercial form is essential to the growing of good peaches. The tree, the fruit and the seed are all benefited most decidedly by its application. Peach soils, being light and sandy, are likely to be deficient in this constituent. In heavier soils, it is often present in an unavailable form and requires cultivation to liberate it. Phosphoric acid is usually applied to the soil in the form of bone meal or superphosphates. Bone meal also supplies a small quantity of nitrogen. Superphosphates are apt to be strongly acid and should be applied in the fall or winter when the tree is dormant, at the rate of about two hundred pounds per acre. Thomas or basic slag is a form of phosphoric acid that gives very good results on sandy soils. It must be very finely ground as it parts with its fertility very slowly. Dissolved South Carolina rock is another valuable form of this fertilizer.

Potash is the most essential element of fertility in a peach orchard. Like phosphoric acid, it induces fruitfulness rather than excessive wood growth. Chemically speaking, it forms salts of the organic acids in the plant, it is supposed to assist in the formation of starch and the assimilation of carbon, and it influences the flavor. Also, when abundantly supplied, it causes the fruit to color up better. It is often deficient in peach soils and must be supplied artificially. The most economical source of potash is unleached hardwood ashes. These also supply a small amount of phosphoric acid. The potash in wood ashes is immediately available. Forty to fifty bushels per acre is the usual rate of application. Muriate of potash is a form of potash that also gives excellent results with peach trees. It is a definite compound containing about 50 per cent. of actual potash and may be used at the rate of 200 pounds per acre. This and other references to the amount required are merely suggestions. Local conditions and experiment alone can tell. A common potassium salt used as manure is kyanite. It is an impure form of muriate of potash, and contains about 13 per cent. of potash. Sulphate of potash is also used by some growers. Potassic manures should be spread over the ground when the trees are dormant in fall or spring and worked in with a cultivator. Wood ashes may be applied at any time.\*

Other elements of importance, but usually present in the soil in sufficient quantities, are lime and iron. Lime is said to strengthen the woody portions of the tree and to hasten the time of ripening of the tree and the fruit. It also has a marked effect upon the physical condition of the soil. It acts as a fertilizer to some extent by aiding nitrification and by liberating potash from insoluble compounds in the soil. Lime also is thought to favor the "catch" of clover, especially crimson clover, on light soils where cover crops are to be grown.

Iron gives a body and a flavor as well as a color to the peaches which readily distinguish them from those grown on soils lacking in this respect. The advantages in quality and color of fruit gained by the presence of iron may be overbalanced by its chemical property of rendering the super-

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\*According to Dr. Wiley, (U. S. Year Book, 1896, p. 129), muriate of potash and kyanite tend to diminish the sugar content of grapes and thus impair the quality of the wine. In the case of sugar beets, also, he says their use is of doubtful propriety. The cause of the injury to these crops is found in the potassium and other chlorides which these fertilizers contain. Reasoning, then, from analogy, it is safe to say that these chlorated fertilizers should be applied with caution to peach orchards that are grown expressly or in part for wine making and the manufacture of jams and other by-products whose quality depends upon the content of sugar in the fruit. For orchards of this kind, it is safer to use potassium sulphate or wood ashes.



phosphates of the soil insoluble. There is not much danger of this, however, unless the iron is present in excessive quantities.

Barnyard manure as a fertilizer for peach trees is not favored by the majority of orchardists. Its use seems to encourage fungus diseases, more so than artificial fertilizers. Hale, the "Peach King," says that peaches stimulated by stable manures are more liable to yellows than those fertilized by commercial fertilizers. The effect of barnyard manure is similar to that of other nitrogenous fertilizers and its use may be governed by similar conditions. For young orchards on poor soil its use is beneficial. The manager of a large plantation in Georgia told the writer that he spreads two forkfuls of manure around each young tree in winter. Generally speaking, its use is confined, as in this case, to the stimulation of early growth in newly set orchards.

*Cover Crops.* Closely allied to the operations of fertilizers and tillage is the growing of cover crops. Neither can be practised economically without the aid of one or both of the others. In the general round of orchard work we fertilize during the dormant season, we cultivate in spring and early summer, and we grow cover crops in late summer and fall. When cultivation ceases, the cover crop should be sown, and in the spring, after serving as a fall and winter covering for the ground, it is plowed under.

There are two kinds of cover crops, leguminous and non-leguminous; the former increases the nitrogen content of the soil by appropriating atmospheric nitrogen; the non-leguminous adds nothing to the soil other than the plant foods taken up in its growth. Cover crops also keep the ground mellow and in good physical condition by the addition of humus; they dry the ground and prevent too rapid wood growth in fall and aid the ripening of the trees for winter; they serve as a protection for the roots; they help to free plant foods in the soil; they prevent leaching of nitrates, when the trees have ceased growth; they prevent soil erosion; they prevent the running together of hard soils; they hold rain and snow till they soak into the earth, and thus increase the moisture supply; they also increase the moisture holding capacity of the soil; they allow early tillage by drying out the soil in spring; and they keep the soil at a uniform temperature, and thus make the winter weather less severe for peach trees. Whether one or all of these benefits may be expected to follow the use of cover crops depends upon local conditions of soil and climate.

The kind of cover crop to grow is more or less a local question. Weeds are better than nothing. Certain crops do better in one part of the country than in another. In young peach orchards it is best to grow a crop of the leguminous type. In bearing orchards, it is wiser to practise a rotation and grow non-leguminous plants occasionally, as a too frequent use of leguminous crops may result in an over-supply of nitrogen.

Among the best of the legumes for cover crops in the peach districts of Ontario are crimson clover, hairy vetch, and cow peas. Crimson clover makes a thick cover before cold weather, forms a very large root growth and altogether furnishes an excellent green crop for plowing under in the north. It is sown at the rate of 15 or 20 pounds per acre, depending upon the richness of the soil. Hairy vetch makes a rank growth and is more hardy than crimson clover. It is much favored as a cover crop but, as the seed is very expensive, it is not so much used as the clovers. The mammoth and common red clovers and lucerne are also grown to some extent and give good results. In the Niagara district where a comparatively long season allows it to make a luxurious growth, cow peas promise to be one of the most profitable and serviceable of cover crops. It is perhaps the best of crops

for this purpose in all sections favorable to its growth. It may be sown at the rate of one bushel to the acre, in drills; or two bushels to the acre when sown broadcast.

Of the non-leguminous crops, rye and oats are the most extensively grown. Rye is a very strong grower and succeeds when others fail. It should be plowed under very early in the spring as its rank growth is apt to rob the tree of its moisture. Oats make a very fair cover in the fall but die down on the approach of winter. Indian corn, buckwheat, rape and various other crops are used as covers, each more or less successful in different parts of the Province.



FIG. 4. Low-headed Elberta tree.

*Pruning.* At the time of planting, peach trees should be trimmed, both root and top, and started with low heads, as suggested under a previous heading. Opinions differ with regard to this point, as already stated, and a diversity of opinion among growers also exists with regard to the proper method of pruning the trees after they are set out. As a discussion of these various methods is scarcely necessary, we shall confine our attention to the one we think best.

During the first season after planting, any sprouts that form below the main limbs should be rubbed off. The main branches will start near the top of the trimmed whip or from the stubs that are left, depending, of course, upon the method of trimming practised. Three or four of these should be selected to form the top, and they should be started from different points on the stem, on different sides and some inches apart. This is a matter of importance, for if all the main branches come out from the same point, there is danger of splitting when the tree matures. Early the following spring, before bud growth starts, all the new growth of the previous summer should be severely cut back.

Some growers advocate cutting back the leading branches to six inches and shorter and removing most of the laterals. Others, less severe, cut back not more than half of the growth and leave both branches and laterals much



longer. The former is probably the better method as it keeps the growth of new wood close to the trunk, and, by removing some of the laterals, it makes the head less dense. In both cases the general outline of the head should be borne in mind, and the tree pruned to form a well-shaped and symmetrical top. The following spring (two years from planting), the trees should be pruned in the same manner, but with less severity. The third spring, and for two or three years following, one-half of the previous year's growth should be cut off. As the trees grow older, less and less pruning will be required. Pruning should always be done in spring to avoid extra work on account of winterkilling. It is well to say here that some of the best growers prefer to reserve the severe shortening in for the second and third years, claiming that shortening in the first year tends to make the top too compact.

When pruning peach trees, we should have a definite ideal in our mind. No kind of tree need be pruned unless there is positively good reason for so doing. Usually a good reason is not difficult to find. We should prune to accomplish something. We should know what we want to accomplish and do it. Some pointers along this line are worth mentioning. Here are some of them, briefly stated: Peach trees inclined to grow very upward should be cut back to induce them to spread. The centre of the tree should be kept open to admit the sunlight and cause the fruit to color up and mature better. All superfluous, diseased and dead branches should be removed and no limbs should be allowed to rub or cross. Leave all wounds clean and smooth, with no long stubs, and paint those above one inch in diameter with either white lead or grafting wax; another good mixture for this purpose is gum shellac dissolved in one quart alcohol to thickness of paint. Growth may be directed by cutting back to a bud pointing in the direction we wish the branch to grow. The bearing wood of peach trees, the previous season's growth, should be kept near the base of the limbs to avoid long straggling branches. The fruitfulness of shy-bearing trees may be aided more or less by summer pruning, but this must be practised with caution.

The advisability of summer pruning admits of discussion. It is a problem yet unsolved, as very little experimental work has been done along that line. If done at the right time (i.e., immediately after the fruit buds have formed), it may bring good results, but if done earlier than this it is likely to produce an extra growth of the wood. Summer pruning young trees also is in an experimental stage. Light pruning at this time to correct bad habits in the young growing trees may be advisable. If such is practised, care should be taken not to remove the tufts of leaves and buds that spring from the base of the limbs as on these are borne the first crop of fruit. Later on these may be cut out if desired. Mr. J. H. Hale has practised summer pruning young trees but now thinks he gets larger trees without such attention. Mr. Hale says he gets larger and stronger trees by no summer pruning because the tree can produce rapid growing main branches more easily than it can send out laterals on a pruned limb. This is logical; think about it.

These few suggestions on pruning would be incomplete without some words on the relation of pruning to winter injury. The danger of winterkilling is obviated somewhat by the method of pruning already outlined,—pruning annually, cutting back one-half to two-thirds of the new growth, and maintaining low open-headed trees. This tends to prevent, however, not to cure. Trees that have suffered from winter injury must be more severely dealt with. Experiments were conducted by the Missouri Experiment Station (Bull. 55) to determine the effect of severe pruning upon trees

that were injured in both bud and wood. We should like to quote the results in full, but as space is limited we shall content ourselves with one extract only: "The best results were obtained by cutting trees of bearing age back into the two to four year old wood, the severity of the cutting depending upon the age and vigor of the tree. Trees pruned in this way have practically renewed their heads. Their wood has ripened up in good condition, despite the fact that they have made six, eight and even nine feet of new wood. The smaller twigs of this new wood carried enough fruit buds to promise a full crop of fruit the next summer."

*Thinning the Fruit.* Pruning the wood and thinning the fruit are allied processes. The practice of heading-in is virtually a thinning process, as it removes a portion of the bearing wood. Any system of pruning materially affects the productiveness of the tree in the following and succeeding seasons. To supplement the work of pruning, and to affect the productiveness of the current season, it is necessary to remove by hand the superfluous fruits. By thus directly picking the redundant fruits, some very important things are accomplished; the trees will not break or be injured from an over-burden of fruit; the trees will be stronger and more shapely; the crops of fruit will be more regular; the labor in culling will be reduced; and the fruit will be greatly improved in size, quality and appearance, and consequently will bring a much better price. Thinning also is a means of insurance against insect and fungous enemies as it not only destroys infested specimens, but, by stimulating the growth of foliage and twig, it enables the tree to better withstand such depredations.

To attain ideal results in thinning, it has been said that we should aim to allow one fruit spur to bear one year and another the next, and to so perform the thinning that the bearing and unbearing spurs will be alternate on the branches. Such an ideal is most desirable but seldom practicable. Ideals of this kind are imaginary things, as a rule, and ordinarily unattainable. Practical experience teaches us a more material mode of procedure. Let us return to it. Most varieties tend to overbear. These, in fact peaches in general, can scarcely be thinned too much. The tendency is to thin too little, if thinning is practised at all. Many growers think the operation is expensive. Possibly it is at the time of thinning when the orchard is making no returns, but after-profits and increase in profits fully compensate for the early expenditure. Undoubtedly thinning pays when the trees are heavily laden. The fact that thinning is practised annually as a recognized and essential part of orchard work in the largest and most paying orchards on this continent, notably some in Michigan, and others in Georgia, of one to two thousand acres in extent, should be sufficient to convince the most sceptical that *it pays to thin*.

Peaches should be thinned as soon as the fruit is nicely formed and before the seeds commence to harden. The usual custom is to thin soon after the so-called "June drop," which takes place when the peaches are about the size of marbles. All diseased, stung, distorted and injured specimens should be picked off, regardless of position. A sufficient number of others should be removed so as to leave on the trees the best specimens, not less than five or six inches apart. The best grade of fruit is obtained when no more than three or four peaches are left on a fruiting branch, the previous year's growth.

*Top Working Bearing Trees.* When the varieties that have been planted are not suited to local and climatic conditions, or to the demands of the market, it is advisable to work them over with some variety of desired merit. This is best done by means of top-budding.



Buds may be successfully set in old wood, but to secure more certain results it is necessary to bud on wood of one season's growth. To get such, the main branches are cut back in winter to within one and a half feet of the trunk. The following season a new growth will spring from the stubs, and this may be utilized for the desired purpose. If the growth has been superfluous, only a portion of the new shoots need be budded. It may be advisable, however, to bud more than eventually will be required, so as to insure a sufficient number of perfect unions. All unions in excess of the desired number, which is usually four or five, may be removed when growth starts the following spring.

The time for budding is in August, and the process is similar to the one suggested for nursery practice. The bud should remain dormant over winter. In spring, as soon as the bud shows signs of growth, the top of the stock must be cut back close to the bud, and all other branches should be removed. By this means, a new and profitable top may be secured.

*Insects.* The scope of this article demands a few words on the insect enemies of the peach, but as the subject of insects is sufficient in itself to supply material for a whole bulletin, we are compelled to content ourselves with nothing more than a passing mention. Information regarding the identification, habits and treatment of peach insects may be had by applying to the Department of Agriculture, Toronto, or to the Biological Department, Ontario Agricultural College, Guelph. The following key to peach insects, prepared by Prof. Wm. Lochhead, Macdonald College, St. Anne de Bellevue, Que., and formerly of the O.A.C., Guelph, we reproduce in full:--

#### KEY TO PEACH INSECTS.

##### A. Attacking the Root and Lower Trunk:

1. Tunneling in the bark and sap-wood of the root, causing the exudation of gum, which is seen at the base of the tree mingled with the castings. Peach Tree Borer (*Sannina exitiosa*).

##### B. Attacking the Trunk and Branches:

1. In early spring a minute caterpillar bores into the shoots of new leaves, killing the growing terminals. Peach Twig-Borer. (*Anarsia lineatella*).

2. Black hemispherical scales attached to the bark. Peach Tree Lecanium (*Lecanium persicae*).

3. A beetle eating the buds, and gnawing into the base of the twigs, causing them to break and fall. New York Weevil (*Ithycerus noveboracensis*).

4. Round scales, gray or black, twigs presenting a scurfy appearance. San José Scale (*Aspidiotus perniciosus*).

5. Oval scars and longitudinal slits on bark. Buffalo Tree-Hopper (*Ceresa bubalus*).

##### C. Attacking the Leaves:

1. Plant lice, living in colonies under the leaves, causing them to thicken and curl. Peach Tree Aphis (*Myzus persicae*).

2. Minute round scales, usually along the veins. San José Scale (*Aspidiotus perniciosus*).

3. Caterpillars protected.

(a) In a tortuous tube. Leaf Crumpler (*Phycis indiginella*).

(b) In folded leaves. Oblique Banded Leaf-roller (*Cacoecia rosaceana*).

##### D. Attacking the Fruit:

1. Long legged, yellowish beetles eating holes in half-grown peaches. Rose-chaffer (*Macrodactylus subspinosus*).

2. Large yellow hairy beetles, eating holes in ripe peaches. Bumble-flower Beetle (*Euphoria inda*).

3. Small snout-beetles making a puncture and crescent in the young fruit. Plum Curculio (*Conotrachelus nenuphar*).

*Diseases.* The diseases of the peach are numerous, and some of them quite hard to deal with. The most important in this Province are brown rot, leaf curl, and yellows. Details of information regarding these may be had by applying to the authorities spoken of under the preceding heading. As with insects, we must limit our remarks upon diseases to merely a list.

The following key to peach diseases was prepared also by Prof. Loch-head, specially for this bulletin:

#### KEY TO PEACH DISEASES.

##### A. *The Roots.*

- (a) Soft corky enlargements usually at the crown of the root, causing the death of the trees before they have attained full growth. Crown Gall (*Dendrophagus globosus*, Toumey).

##### B. *The Stem and Branches.*

- (a) The buds unfold prematurely and the new shoots become slender, sickly and yellow. The Yellows.
- (b) The buds form compact tufts or rosettes, containing one or two hundred leaves, which are yellowish green. The Rosette.
- (c) A copious outflow of gum upon the twigs and branches usually from spots near the buds. Gummosis or Gum Flow.
- (d) New shoots become thickened and enlarged. Leaf-Curl (*Exoascus deformans*).
- (e) Winter buds do not sprout as in the case of Yellows; leaves dwarfed and yellow from the first. Little Peach.

##### C. *The Leaves.*

- (a) In May and June the leaves curl up, become deformed, much thickened and pale yellowish green, then rosy or purplish in color. Affected trees lose their leaves before midsummer. Leaf Curl (*Exoascus deformans*).
- (b) Numerous minute brown spots on the under surface of the leaves which fall early. Peach Rust (*Puccinia pruni-spinosae*).
- (c) Minute purplish spots appear; later, the tissue dies, and minute holes like shot-holes appear in the leaf. Shot-Hole Fungus (*Cylindrosporium padi*).
- (d) A white mildew appears on the leaves. Rose Mildew (*Sphaerotheca pannosa*).
- (e) White mould-like growth, causing the leaves to become hard and curled. Peach Mildew (*Podospaera oxyacanthæ*).

##### D. *The Fruit.*

- (a) Scattered tufts of a brownish mould first appear, followed by a soft rot. Later the fruit dries, and may remain on the tree over winter as "mummies." Brown Rot (*Monilia fructigena*).
- (b) Sooty-black spots or patches on the fruit, often accompanied with cracks. Peach Scab (*Cladosporium carpophilum*).
- (c) Minute light-brown, velvety spots with a reddish border, frequently resembling minute pustules. Brown or Pustular Spot (*Helminthosporium carpophilum*).
- (d) Large light-colored spots with formation of many hairs or fuzz: Under these spots the flesh becomes hard. Rose Mildew (*Sphaerotheca pannosa*).
- (e) Irregular, mouldy patches on the surface, followed by a cracking of the fruit. Peach Mildew (*Podospaera oxyacanthæ*).
- (f) Tardy ripening of the fruit, which is dwarfed in size; no red spotting of skin or flesh. Little Peach.
- (g) Premature ripening of the fruit, which is red spotted and streaked. The Yellows.

*Some Thoughts on Spraying.* Although we have requested the reader to look elsewhere for information regarding insects and diseases, and the best means of combatting them, we shall consider here for a moment a few thoughts on spraying. Spraying is a means to an end. In peach growing, the end in view is to produce in quantity a grade of peaches that approaches as near as possible the ideal looked for in the particular variety or varieties grown. Spraying helps the grower to do this. It increases the percentage of high grade fruit by holding within bounds the ravages of the aforementioned insect and fungous enemies.



To spray intelligently, we must study the enemies to be warred against. The time to spray, and the method of treatment depends entirely upon the particular case at hand. We must know definitely the peculiarities and the vulnerable points in the life cycle of the pest to be treated. Besides this, a well informed orchardist must be somewhat familiar with the chemistry of insecticides and fungicides.

A knowledge of insects is important because many of them necessitate peculiar methods of treatment. Insects that work beneath the soil, or those that work within the wood require remedial measures different to those adopted for surface working insects. Other cases also requiring special attention might be mentioned. As a general thing, however, remedial measures are determined by classifying insects into two groups, viz., sucking and biting. For sucking insects, some substance is used which will kill by contact, either as a caustic or by closing the breathing pores and smothering. Biting insects are treated by direct poisons, which may be applied to the plant, and which will be swallowed by the insect. For both classes, certain obnoxious substances used as repellent are sometimes valuable.



Fig. 5. Trees sprayed with lime for winter protection, O. A. C., Guelph.

The vulnerable spot in the life history of fungi is usually found in the spore. These are produced at different times by the various species of fungi and are disseminated in many ways, and some species are quite difficult to combat. For these reasons, the treatment must be largely preventive, not curative. The work of applying the fungicide must be done thoroughly and at a proper time. Every portion of the leaf and branch must be covered with the spray. The number of applications depends upon atmospheric conditions. Dry weather is unfavorable to the growth of most fungi, moisture affording more congenial conditions.

To spray effectively, proper apparatus must be used, and to spray economically the best of apparatus is none too good. Apparatus should be selected that is thoroughly adapted to the work, simple and strong in construction, and easy to operate. The fittings with which the spraying mixture comes in contact should be of brass. As part of the fittings, there must be a good agitator to keep the mixture stirred. Many styles of spray

pumps are on the market. One cannot say which is the best. When buying, we should select one that is strong and durable, efficient and cheap. While the cheapest is not always the best nor the best always the cheapest it is not particularly gratifying to find that we have paid more than the pump is worth, even though a good one. Next to the pump itself is the nozzle, and probably it is the more important of the two, as upon it depends the thoroughness and economy of the operation of spraying. The best nozzle, it has been said, is one that will give the finest possible spray with the greatest possible force. It also should be durable, strong and efficient, and not subject to clogging.



FIG. 6. Unwhitened and whitened Flemish Beauty pear trees, O. A. C., Guelph.

*Winter Protection.* Outside of the peach belt of Ontario, the Niagara District and that portion of the Province fringing on the Great Lakes—the growing of peaches as an industry has many drawbacks. Even in favored sections, peach growing is attended with many difficulties. The cold winter, the lateness of spring, and the tenderness of the peach tree make difficult its culture. To overcome to a certain extent these difficulties, the grower must acquaint himself with the best methods for protecting the trees in winter. Some are already familiar with this phase of the question; others are not, so a few suggestions along this line may be of value.

The most serious hindrance to successful peach culture in Ontario is the winter-killing of the fruit-buds. In some parts of the Province good crops of peaches are grown with very little winter protection. In other



portions, however, it is absolutely essential to protect the tender buds in winter. Our changeable climate makes the question of winter protection important in all parts of the Province.

Winter-killing is attributed to various causes, some of which are: (1) immaturity of the wood and buds in fall, due to late cultivation, excessive use of nitrogenous fertilizers, or warm autumn rains; (2) severe and continued freezing is sometimes directly responsible; (3) sudden changes of temperature, causing sudden thawing and sudden freezing; (4) swelling of buds during warm days in winter, and subsequent freezing; (5) an excess of humidity in the soil which is apt to favor the premature flowing of the sap in early spring; and (6) an unfavorable exposure.

Probably the most practical methods of protecting peach trees are wrapping (*i.e.*, closely drawing together the branches, and wrapping with cornstalks, straw or canvas), and whitewashing. Layering, or laying down the trees in autumn, and covering with soil, spruce boughs



FIG. 7. Peach trees unsprayed and sprayed in young orchard, O.A.C., Guelph.

or other material, is resorted to with more or less success; but is, under most conditions, a rather laborious and expensive practice. Whitewashing the branches and buds, being of more recent introduction, has not yet received the attention its merits deserve. It is, nevertheless, the most promising means of winter protection yet suggested. Whitewashing retards the bloom, as heat is reflected by whitened buds, rather than absorbed. Experiments have been conducted along this line by Prof. J. C. Whitten, Horticulturist at the Missouri Experiment Station, also, by W. M. Orr, Fruitland, a prominent Ontario fruit grower, and by W. T. Macoun, Central Experimental Farm, Ottawa. Peach buds are known to swell and start into growth during warm spells in late winter and early spring. In explanation of this, Bailey says: "The bursting vegetation of springtime is supported by a local store of nutriment, and is more or less independent of root action." An erroneous idea regarding this fact exists among certain fruit growers, some of whom believe that buds cannot swell or grow while the roots remain frozen or dormant. Both direct experiment, and the study of plant physiology, prove this to be untrue.

Regarding the experiments at Missouri, Prof. Whitten says: "Whitened buds remained practically dormant until April, when unprotected buds swelled perceptibly during warm days late in February and early in

**March.** Whitened buds blossomed three to six days later than unprotected buds. Eighty per cent. of whitened buds passed the winter safely, when only twenty per cent. of unwhitened buds passed the winter unharmed."

Mr. Orr's experiments also showed that sprayed trees were later in blooming than those untreated. The tests made at Ottawa confirm these, and in addition it was found that spraying with lime was effective, to a great extent, in killing the oyster-shell bark-louse. It is also claimed that whitewashing in winter will greatly lessen the damage done on different classes of fruits by such insects as the borers, and by fungous diseases, such as the peach curl.

The use of the lime-sulphur wash also has an effect in delaying the blooming period, but, as it is not applied until early spring, its value in this respect is not marked. Before the customary time for applying this wash, peach and other tender trees are liable to injury. For purposes of winter protection, a lime wash must be applied earlier in the season.



FIG. 8. Apple trees in young orchard, O.A.C., Guelph. Unsprayed buds of tree in foreground, bursting into growth. Sprayed trees dormant.

Whitewashing should be done early in winter; apply two coats and repeat as often as required to keep the trees white. The following formula was used in some confirmatory experiments, conducted by the writer at Guelph during the winter of 1901-02, and gave good results:

Lime .....	2 lbs.
Water .....	1 gal.
Skim milk .....	1 qt.
Salt .....	5 ozs.

Slake the lime in warm water, stir to slake quickly and well, add remainder of ingredients and mix thoroughly. Then strain through a sieve, having a mesh of one-twelfth of an inch in diameter. Apply when hot with a spray pump, fitted with a Bordeaux nozzle. Amount necessary, averages one gallon to a tree at each spraying; time required to apply, five to ten minutes; cost, eight to ten cents per tree for the winter. A brief account of the work in winter spraying at Guelph will be found near the end of this article.



## HARVESTING AND MARKETING THE PRODUCT.

*Picking.* Numerous system of paying pickers are practised. One grower pays by the day, another by the crate, another by the average, and others by something else. There is no uniform system of payment employed in this or any other country. Perhaps such is not necessary. The one outlined below was noted by the writer when in Georgia, and could be adopted by Ontario growers with advantage: Before leaving for the orchard in the morning, each picker is given a sack containing a number of tickets, each ticket bearing the number of the picker to whom it belongs. In the orchard, the picker places a ticket in each basket of peaches that he picks. When the fruit reaches the grader in the shed, he takes care of the tickets he finds in the bottom of the baskets and gives them to the time-keeper.

The time-keeper credits the grader with the quantity of tickets that he (the grader) has gathered from the baskets, and credits the pickers with the quantity of tickets received bearing that individual picker's number; hence, one lot of tickets suffices for both pickers and graders. The pickers (packers and graders also) are paid so much per day with advantage of increase over average number of baskets picked, or crates packed during the day.

For example, at the Hale orchards, the packers are paid one dollar for the average number of crates that day. If the average for the day happens to be fifty crates, each packer receives two cents per crate for the work he has done. The packer who has packed over 50 (the average) is paid at the rate of two cents per crate, and the one who has packed less than the average, receives a corresponding decrease. The following day the variety and grade of peaches being packed, may be larger or smaller, as the case may be; if the former, the average will be higher and the packers will receive a lower rate per crate, or if the latter, a relatively low average will be the result, and a correspondingly high rate per crate.

This system of paying the fruit workers,—known as the “average system,”—is satisfactory both to employer and employee. The former gets more work done for less money than he could by any other system of payment, and the employee who is a little better than the other fellow, feels that his efforts are being substantially recognized. Personally, I may say that at first I thought the system unfair to the employee, and it certainly would be if all the packers were experts, as then the average always would be high; but, after talking with the packers, I found that all appeared to be pleased and satisfied with the method, on account of the fact that from day to day throughout the season new and inexperienced hands are employed, who tend to keep down the average, and enable thereby the best workers to make a good showing above the average for the day.

To fully estimate the advantage of the system to the employer, I noted, on a particular day, the difference between the results of this system and those of a system practiced on a neighboring orchard.

*Hale's*—150 crates for \$1.00 (average system).

*Neighbor*—40 crates for \$1.00 (day system).

I have referred to the packers and packing for convenience in explaining the system, not because they alone are paid in this way. Such is not the case, as the same method is used in paying the pickers and the graders, and with the same degree of satisfaction and success.

The pickers are handled in the orchard as follows: Over every twenty-five pickers is one foreman, with assistant if necessary. To prevent delay, each picker carries a couple of baskets to the orchard, where they are started picking, one picker to a row. When picking, a ticket is first placed in the basket, then the peaches, and when the basket is full it is left under the tree. The baskets are then carried by boys to convenient places for loading on single horse orchard wagons, (known in Georgia as "Dunkirks"), which go about among the trees gathering up the baskets and carrying them to the avenues where they are transferred to larger wagons or lorreys ("floats") that ply between the orchard and the packing shed.

These lorreys leave the barns loaded with empty baskets in the morning. In the orchard, the empties are distributed by basket boys, who

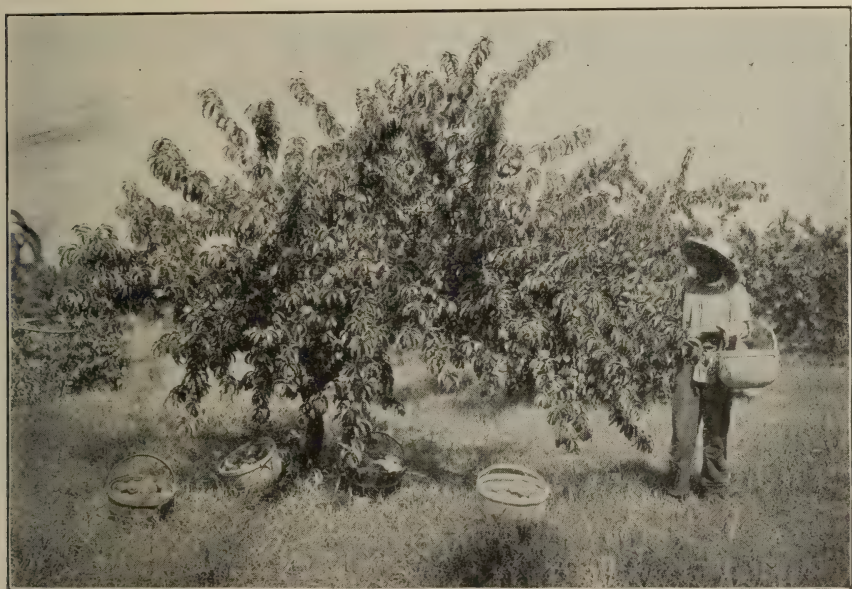


FIG. 9. No ladders are required to pick peaches from low-headed trees.

should keep ahead of the pickers to prevent loss of time. Four or five basket boys are required for twenty-five pickers. Two boys are also employed to keep pickers supplied with drinking water. This is merely an outline of the orchard practice, and may not be suited to all conditions, as at all times and in all orchards it is necessary to adjust labor to suit existing circumstances.

The trees are gone over two or three times to get the fruit at the proper stage of maturity. Practice soon teaches the pickers the proper stage for picking. In general, the fruit is in the right condition when it is full grown, but yet firm, and when the ground color takes on a faint yellowish tinge.

The opinion is commonly held by many growers, that peaches should be picked on the green side of maturity, to insure the best keeping quality. Investigations show this opinion to be erroneous. Experience teaches that peaches keep best when picked fully matured, full grown, well colored, yet



firm, but by no means either ripe or green. Peaches that are picked too green will shrink rather than ripen, and they never attain their proper flavor.

Regarding this question, Prof. G. H. Powell, Pomologist in Charge Fruit Storage Investigations, Washington, D.C., says: "In our fruit investigations we have observed that after green fruit is picked, it ripens more quickly than more mature fruit of the same variety, and the chemical changes have been shown to progress more rapidly. Green picked fruit, therefore, reaches the end of its life in the warehouse (or car, when in transit) as quickly, or even more so than the latter. Poorly colored fruit brings the lowest price; it does not attract the customer; it never acquires that exquisite bouquet, or aroma, or that fine quality that is characteristic of a highly colored, well-matured specimen."

There is another point in connection with the picking of peaches that deserves attention, and, judging from my observations, a word of caution. Oftentimes on display in the market, we see peaches, originally



FIG. 10. Picking Baskets and Carrier of second grade Elbertas, showing a 2-1 pack.

high grade, showing the effects of bad handling. This condition may be due to poor methods of picking, or to subsequent rough handling on the market stand. If the trouble is to be found in the orchard, it should be remedied. Picking methods, for good results, demand that the fruit be handled more like eggs than potatoes. The picker must be careful to grasp the peaches very lightly, and to drop them into the basket with care, or he will bruise them and cause them to become discolored. Peaches should be handled tenderly and as little as possible, for every evidence of careless handling detracts from both their market and shipping value.

*Grading.* Nowhere in America, perhaps, is there a more perfect system of handling peaches than that practised in the Hale orchards. Their methods of picking, packing and selling are most worthy of being adopted in the orchards of Ontario and elsewhere. For this reason, we shall refer to their methods somewhat fully in our remarks upon these phases of the industry, adapting them, however, as far as possible to our own condition. The system of grading and sorting is as methodical as the system of picking. Each packer has a grader, who grades the peaches according to size and variety. Each variety is usually assorted into three grades, each grade being marked in accordance with the grade mark chosen by the grower as

there has been no uniform marks adopted as yet in Georgia. Hale marks the first grade, extra fancy; second, fancy; the third, the name of the variety only. Thus:

No. 1 .....	X Fancy Elberta
No. 2 .....	Fancy Elberta
No. 3 .....	Elberta

The graders are constantly watched and instructed by experts. All ill-shaped, bruised, rotten and very small peaches are thrown out and sent to the distillery. The best of them may be used in cannery or evaporating plant.

As a rule, the Georgia grower prefers hand grading to machines. Mr. S. H. Rumph, of Marshallville, Ga., the originator of the Elberta, favors the mechanical grader and has a number of them in operation that do very good work. They are made by Messrs. Maul & Miller, Crescent City, Florida. Personally, I noted that this particular grader was all-right as far as the assortment of sizes was concerned, but it failed to reject the bruised and bad-shaped fruit, and besides, I was rather disappointed with its speed. I shall not presume to condemn it, however, as I may not have seen it under favorable conditions. Hale says this is probably the best grader made, but all are unsatisfactory.

Under the head of picking, we considered the method of keeping tally with, and paying, the graders.

**Packing.** Mr. Hale uses different packs for the different varieties and grades, the size of the peach determining the pack to use, and all his peaches are packed in the standard six-basket Georgia carrier. As it is rather difficult to explain in writing the various packs used, the reader is referred to the accompanying cuts for a fuller understanding.

For sizes or grades that make *three layers* in a basket or "cup" of the carrier, a 2-2, a 3-2, or a 3-3 pack may be used. For *four layers*, a 4-3 or 4-4 pack can be used, but it seldom pays to systematically pack peaches of this size. For *two layers* (usually first grade), it is best and necessary in most cases to use a 2-1 pack, although sometimes to make the cup high enough, it is necessary to place the bottom layer on end. Packing on end, however, is resorted to very seldom. It is a bad practise. Rather than pack on end, it is better to change the pack, using three layers and a corresponding system that will bring the peaches to the right height.

The carriers used for grades Nos. 1 and 2 are neatly labelled. No. 3 goes into plain crates, having no mark other than the name of the variety. In all of them the peaches are firmly packed to prevent change of position and bruising while in transit. The rosy cheek of the peach is placed uppermost, and the peaches are all pointed the same way in the cup. When the carrier is filled the packer puts his ticket on it and sends it to the nailing table where it is inspected. If found satisfactory, the cover is nailed on immediately and it is carried to the car; if not packed to suit the inspector, it is sent back to be re-packed by the packer, whose number corresponds to the number found on the ticket.

Some growers use what is termed a "spring" pack; i.e., a full layer on the bottom of the cup, a partial layer in the centre and another full one on top. In reality, it is a false pack, and one that is unsatisfactory as it is liable to become loose before it reaches the market. Other growers use a two layer pack with both layers on end. Peaches packed in this manner are apt to become crushed through pressure of the crate top on the tender



end of the peach. In the Hale orchards, peachers are packed on end only when absolutely necessary and that is seldom; in Ontario, in our Climax basket, it is the universal practise to pack on end and this practise should be condemned.

The point or apex of the peach is the most tender part of the fruit, as it ripens first; hence, when peaches are packed on end they are apt—almost sure—to become crushed by the pressure of the upper layers, and when the baskets are piled, by the weight of the upper tiers. Probably the unsuitableness of the Climax basket for fancy packing is one of the reasons why the Ontario grower packs peaches on end. And this leads to a few thoughts on another phase of our subject.



FIG. 11. Elbertas, in Georgia carrier, showing a 2-1 pack.

The oftener I see and study the behavior of peaches in the Climax basket, the less favorably impressed I am with its utility as a package for high-grade and fancy fruit. It certainly is a most satisfactory package for some kinds and grades, but for all classes and grades that require systematic packing, or "laying up" as some people call it, it is "not in it" with the Georgia carrier, and some of the other styles of packages used in other countries. The Climax basket is not adapted to fancy packing. The top is not properly covered to keep any one of the various packs firmly in position. The sides and handles of the basket are not sufficiently rigid to admit of any pack other than what would be termed in Georgia or California a straight 4-4, three-layer pack. This is the simplest of all the peach packs and apparently it is the only one known to most of the packers I have seen at work in our peach districts. The cause is easily found. While a score of different packs can be put in the Climax basket, the foregoing is

the only one that reasonably can be expected to keep its place. The practice of spreading the handle when the cover is put on, loosens the fruit and, as a consequence, a fancy pack would be spoiled. Even the customary 4-4 pack often reaches its destination in a disordered state. The Climax basket is objectionable also, in the fact that the flimsy leno cover permits tampering with the fruit, and also allows dust and dirt to enter. One of the first needs of our fruit industry to-day is a better package and better packing for our fancy fruits. I personally would recommend for peaches, the adoption of the six-basket carrier at present so largely used in nearly all states of the Union, and which I shall attempt to describe under the following heading.

*Packages.* In Georgia they use a light carrier containing six baskets, holding four quarts each. It is a very strong package, gives good ventilation, is neat in appearance, and costs only 12 cents with the divider, six baskets and cover. The best type of carrier is one that is put together with strong wire staples well clinched on the inside, and is made by the Georgia Fruit Package Co., Fort Valley, Ga. The panel heads afford a secure grip to the hands, and damage from breakage rarely occurs. When loaded in cars, the shape of the package permits a perfect fit; the tiers are separated for ventilation by means of inch slats tacked across the ends of the packages. This package is worthy of universal adoption. Michigan uses it for her best grades of peaches. Nearly all the southern states have adopted it. Texas, a coming peach state, and where to-day thousands of acres are being planted, adopted it at the outset. In Canada, where no uniform peach and plum package has yet been adopted, it should receive the closest examination and the consideration of each and every grower. Even though it might cost more to make it in Ontario than in Georgia, the package would be cheap at twice the price mentioned.

In the economics of fruit marketing, the package plays a most important part, and a uniform package should be used. Sometimes, when a man handles peaches solely upon his own account, and for a local fancy market, he can advertise his goods with advantage by adopting a package unlike those in common use. As an illustration of a most unique and striking package, something decidedly out of the ordinary, it may be interesting to mention one originated and used by the proprietors of a large fruit house in Buenos Ayres, Argentine Republic, where the writer spent some months during 1904 and 1905. This package is made of a species of swamp grass or rush, fitted in a skeleton framework of wood. The rushes are placed side by side and fastened at both ends, and in the middle, by strands of light wire. The light framework of wood which encloses the inner rush package is stained crimson or some other color that is attractive. This package may be made any size; it gives good ventilation; is neat in appearance; lessens the danger of bruising to the lowest degree; is easily handled; and is strong enough for its purpose,—a local fancy trade with private customers; but it has no place in the list of packages for export or for even the general home market. It is mentioned here for the benefit of the few who may have occasion to use a package of this type. The adoption of un-uniform styles of packages, however, may be carried too far and lead to confusion. It is imperative to the success of our peach industry that a uniform package be used.

For foreign shipments, different styles of packages have been used, and others are constantly being tested. So much depends upon the condition and particular grade of fruit, and upon the available means of transportation, and very much also depends upon the demands of the market to be



catered for, that I shall not now presume to mention others than the carrier and a very good package that is extensively used in some peach sections of the United States and Canada, shown in Fig. 12.

*Wrapping.* Experience is teaching growers that it pays to wrap peaches. It prevents bruising and the spread of brown rot (*Monilia*), adds to the appearance of the package, and above all, it increases the profits. Trial shipments from Georgia have brought fifty cents per carrier more than for unwrapped. This is worth considering when the extra cost to wrap a carrier amounts to no more than six cents. Fairly heavy paper has given better results than tissue paper.

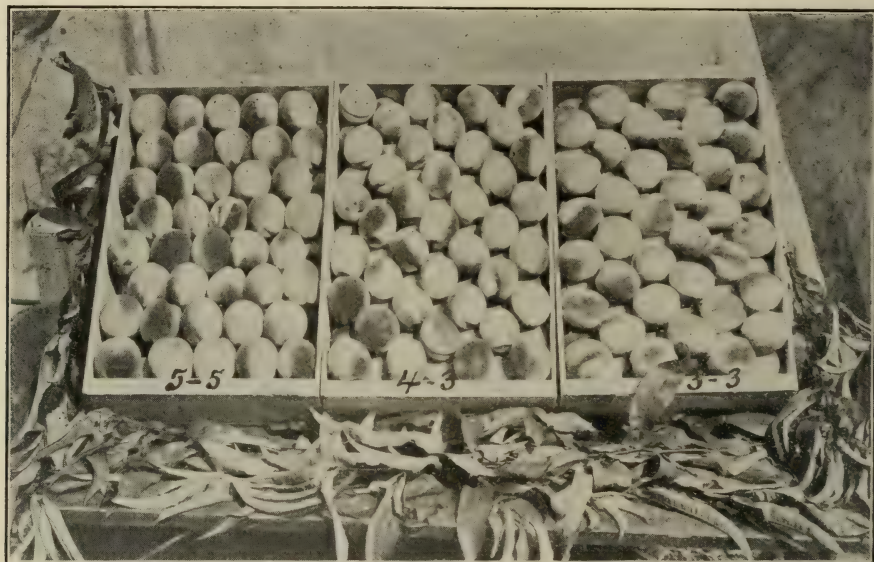


FIG. 12. Peaches for export unwrapped, showing three styles of packs.

One report from New York stated that in carriers that contained unwrapped peaches, 10 to 15 per cent. were bad, while only 5 per cent. were bad in carriers that were wrapped. Similar reports have been received from Winnipeg with respect to peaches shipped there from the Niagara district.

Wrapping seems to add or bring out the color. Mr. Hale says: "Wrapping is decidedly the best caper for soundness and color." From now on he expects to wrap a large portion of his output. Other growers in Georgia, many in other States, and the leading shippers in Canada, are doing the same.

In cold storage, the effect of wrapping is not so noticeable on peaches as on other classes of fruit, mainly because peaches as a rule are not stored long enough for any advantages to be well marked. Experiments show, however, that wrapped peaches retain their firmness and brightness longer and are less apt to show a discoloration of their compressed sides when removed.

*Shipping and Selling.* After fruit has been packed for market, the next thing is to get it to its destination in the best possible condition at the least possible cost. This is the actual transportation problem and it involves many minor problems of more or less importance in themselves—whether or

not peaches should be cooled before shipment; the question of a proper system of refrigerator cars and railway facilities for shipment to the local market, the North-West market, or to the seaboard for export; the proper means of transferring shipments from car to steamship, when foreign consignments are in transit; the advisability of official inspection at the wharf; ocean transportation, including refrigeration, with adequate ventilation and thermographs for registering the fluctuations of temperature; and finally, the handling and disposal of the fruit on the market, at home or abroad. These are questions that require expert study and investigation. Both Dominion and Provincial Governments are doing excellent work in these directions, not so much with peaches perhaps as with apples and pears, but there is no reason why our peaches cannot be placed on the English markets. The authorities at Washington have shipped peaches to England with success. The Ontario grower can do likewise, even though a few trial shipments have not proved satisfactory. The solutions of the problems mentioned above



FIG. 13. Peaches wrapped for export.

rests as much with the grower as with the government. Many prominent fruit men are, by individual or collective means, aiding the government to solve these problems. Others, however, fail to recognize the fact that the successful transportation and marketing of peaches is dependent largely upon the quality of the work that has been put upon the orchards, and upon the preparation of the fruit for shipping. No system of transportation can insure the safe delivery of peaches that have been handed over for transportation in a condition unfit for safe carriage. The problem of transportation begins with the picking of the fruit and involves all operations in succession from the tree to the consumer.

At the Hale orchards the carriers are loaded into the cars at the packing house and through trains carry them to New York and all points in the north. A fast schedule is arranged for these trains to deliver the fruit on the market in the best possible condition. The cars are iced three times between Fort Valley and New York. These cars are forty feet in length and when loaded about two-thirds full, five tiers high, they carry 560 carriers; in wet seasons, the number is reduced one tier.



There are many different types of refrigerator cars now in use, some with the ice chambers on the end, some iced over head and others iced in various ways; none are entirely satisfactory. The objection to them lies not so much in the method of icing, as in the lack of proper ventilation, and, as a consequence, it is difficult to maintain an even temperature. Investigations show that different temperature are found in different styles of cars and in cars of the same style. As a rule, the temperature at the top of the car ranges ten degrees higher than that at the bottom. This, aided by the moisture thrown off from the fresh peaches, is favorable to the spread of brown rot (*Monilia*), and should be remedied. Quick refrigeration is essential to prevent the spread of this fungus, which can do so much damage in 24 hours.

No refrigerator car yet constructed, whether in Canada or the United States, can give quick refrigeration. For this reason, it is advisable, when possible, to have the fruit cooled before it enters the car. Furthermore, the fruit can be picked in better condition, riper and more mature. A local cold storage plant, adjoining packing house, into which the fruit could be placed and cooled before it goes into the car, should be considered a part of the equipment of our up-to-date orchards. Such is feasible, however, only on large plantations or in connection with co-operative central packing houses.

Safe commerce in fruits depends upon the quality and appearance of the commodity that we have to offer and upon the value that we may get for it. High grade peaches are always in demand. It is only the inferior grades that go begging for a market. What the market wants first of all is soundness and good-keeping qualities, and nearly uniform size throughout the package. Uniformity in appearance and size means a good deal. It means the difference between high and low prices. To secure uniformity in packing from any one particular locality by individual shipments is an impossibility. The solution of the question lies in co-operation.

The Ontario peach industry is reaching that stage where individual effort must give way to co-operation. The ordinary individual alone cannot command the same attention and the same market that he can when working in company with others. Of course, a co-operative shipping association has its disadvantages as well as its advantages. The difficulty of maintaining a uniform grade is one of its most serious drawbacks, but this can be overcome by co-operating earlier in the game. The best system of co-operation begins in the orchard, or if this is not practicable, co-operative packing is. Unless the packing and grading of peaches is superintended by one man it is impossible to secure uniformity. A co-operative association organized solely for the purpose of selling is all right in theory, but in practice it is usually found wanting. To insure success in co-operation, the association must control the packing as well as the selling. Such an association has many advantages. A better distribution of the crop is secured. The association is in a better position than the individual to keep in touch with the needs of the market, and, as a consequence, "gluts" are less likely to occur. Salesmen can be employed who will sell the fruit to the best advantage. Uniformity in packing and in packages can be had. Men can be hired and fruit packages can be bought to better advantage. Better and cheaper storage and transportation can be secured. Higher prices and better markets can be commanded by controlling the output. The profits of the middle or commission man can largely be done away with.

Shipping and selling on commission is a most unsatisfactory way of marketing peaches. There are times and seasons, however, when it is necessary to sell in this way. In such circumstances, the peach grower individually or collectively should ship to only one commission house in the same market. By so doing, he will not compete against himself, and, by careful grading and honest packing, his fruit often may be sold before it reaches the market. He should keep in close touch with his commission man and the market generally. He also should use a private telegraph code to make communications secret and to lessen the expense of telegraphing.

Some markets prefer a yellow-fleshed peach to a white and *vice versa*. Large peaches do not always bring the most money; sometimes they bring less. On many occasions I have known cases of second-grade Elbertas to bring twenty-five cents more than the same day's quotation for first-grade.



FIG. 14.: It requires thrift, industry and intelligence to grow peaches like these. Seventy-two bouncers to a carrier.

### THE SURPLUS AND BY-PRODUCTS.

*Gluts in the Market.* The purpose of this section of our article on the peach industry is to offer a few suggestions that may help the orchardist to overcome a very serious cause of loss in successful peach culture, a drawback that affects, in seasons of abundant crops, the entire peach growing area of the Province, viz., the occasional demoralizing "gluts" or "slumps" in the market that break down prices and discourage growers, old and new alike. Naturally, the question might arise: What is the cause of such gluts in the market? Are they the result of over-production? Economists say that there is no over-production of any article so long as there is a person in the world in need of such article. Such is rather a broad view of the situation; yet, when we follow their argument further and attribute the fault to the lack of proper distribution, rather than consider it the result of over-production, the force of the thought is apparent. The crying need of the peach industry is for a system of distribution that will insure a greater demand for our produce, and, as a consequence, better prices.



Just how to establish a well organized system of distribution is a difficult problem to solve. It is a noticeable fact that, when slumps occur in large cities, there often are smaller towns where peaches cannot be bought at any price. Probably the solution of the problem lies in co-operation. Some arrangement with dealers in small towns by which they may communicate their needs to the larger dealers of the cities, and through the latter to the peach growing centres, would certainly tend to lessen the difficulty. By this means, the empty and full markets could be located and shipments consigned accordingly.

Another way to avoid gluts in the market lies in co-operation with the railway lines. To place peaches on distant markets in good condition we require a better system of refrigerator cars and quicker transportation than are now at our command. The objection to the present styles of cars was noted under the heading of shipping. To better the condition of things in this respect, railway lines should be asked to supply a class of cars adapted in all respects to the requirements of the perishable peach. A fast schedule for such cars should also be asked for, or rather it should be demanded, as peaches cannot be handled as ordinary freight and reach the market in prime condition. And, to reciprocate, peach growers must ship regularly and in quantities sufficiently large to make it worth while for the railway companies to meet these demands.

An apparent local over-production of peaches is due sometimes to faulty methods of marketing. A good article, true to name and grade, and put up in clean and uniform packages, always brings a good price in any market. Poor fruit, dishonestly graded and packed in packages scarcely fit for potatoes, is difficult to sell at any time. As a rule, the grower who offers for sale a class of peaches that is a little better than the other fellow's, will find a ready demand for the product of his pains in any market that is overstocked with inferior peaches, and even high grade peaches, in inferior packages.

When all resources fail to bring good prices for the peach crop in the fresh state, it is necessary to find other means for its disposal. Eating when ripe is certainly the most agreeable way of using peaches; probably nine-tenths of all grown are eaten in their uncooked states. But large quantities are also canned, evaporated, distilled and disposed of in other ways. The question of handling to advantage the surplus and by-products of the peach industry is a most important one to all orchardists. There is no necessity for the grower to suffer loss in years of abundance, when there are so many ways in which the surplus fruit, both good and bad, may be saved from the hog pen and the compost. By means of the canning factory, the evaporating plant, and the distillery, we can utilize fruit that would otherwise be a loss to the grower. Other means, as noted in the following pages, may also be resorted to. In all these cases, numerous and various methods are practised. It is not our purpose to discuss them all in minute detail, nor to intimate that the systems noted in the following paragraphs are the ones *par excellence*. What we do present for the reader's consideration is the result of our observations, limited though they may be.

*Commercial Canning.* This is a business by itself and one that requires expert management to be a success. The average fruit-grower who intended to go in for canning as a business would have to employ an experienced canner, as it would not be possible for him to attend to the orchard, the gathering of the fruit, and the management of the cannery at the same time. To be successful, a cannery must be run for as long a season as possible and with economy, so as to do the largest amount of work for the capi-

tal invested; and nothing but standard or high-grade fruit should be put up, so that a name and reputation for reliability and excellence of the output can be established. Unless the orchard be of large size and planted with selected varieties, ripening in succession, and especially adapted for canning, it would not be possible for the individual grower to keep up a constant supply of suitable fruit for the cannery from any one orchard. For these reasons it is obvious that the average fruit grower, without experience, would in all probability fail to make a success of the canning business. A more practical idea would be the establishment of co-operative canneries in the centres of our principal fruit growing districts.

One of the simpler processes of canning peaches that I noted in the south may be briefly described as follows: The fruit, on arrival at the cannery, is first halved, pits removed and peeled. This is done by women who are paid so much per bushel for the work, usually about twenty cents. About 75 good peelers are required to turn out 10,000 cans of first-grade fruit per day. For low grade fruit, such as "peeled pie"—which is only another name for fruit-pulp—more peelers are necessary. In both cases foremen should instruct and watch the peeling.

From the peelers the peaches are carried by boys to the packing or filling tables. Here they are placed in cans, the size of which depends upon the grade of fruit being put up. Standards, or first grades, are packed full and tightly into the cans; second grade and peeled pie are placed into the cans only two-thirds full. About twenty or twenty-five packers are required to handle the peaches for the above mentioned daily output.

To aid in its preservation, the higher grades are sweetened, either with sugar or syrup. The latter is made by dissolving the best crystalline cane sugar in boiling water, and is added when cold till the can is completely filled with fruit and syrup. A more common method, however, is to place the sugar directly into the cans, and before the peaches are put in. Enough sugar for each can is added to make what is termed a twenty degree syrup. The strength of the syrup varies, however, according to the quality of the fruit being put up.

After the sugar and fruit is added, the cans are "trayed off" (i.e., placed on wooden trays containing a definite number of cans each), taken to the water tank and filled with water.

The trays are now placed in an "exhaust" box and steamed; standards, jacket pie (unpeeled peaches) and peeled pie for five minutes, second grade for three minutes. This is done to have the peaches thoroughly heated before covers are put on, in order to insure a better state of preservation. The time for steaming can only be known by practice, the above mentioned time being only approximate.

From the exhaust box the fruit is taken and placed on a wiping table, where a girl wipes off the tops of the cans with a brush. To keep tally of the work done by the "cappers," who are to follow, the girl places a check or ticket on each tray.

The cappers then take the cans, pocket the checks, and "cap" the cans; i.e., solder on the lids. A vent-hole in centre of cover, to allow air to escape when capping, is also tipped with solder. The cappers should mark the cans (each man having a distinct mark) to trace the origin of possible leaks. Three men can cap and tip 10,000 cans in ten hours. They are paid by the piece, usually about \$1.50 per 1,000.

After capping, the cans are placed in iron cages and "processed;" i.e., submerged in boiling water and cooked till the fruit has reached the proper



degree. In the cooking of the fruit expert knowledge is absolutely necessary, as no hard-and-fast rules can be laid down. It is simply a question of practical experience, and depends entirely upon the variety and grade of fruit, its ripeness, texture and cooking qualities. The time required for peaches to be properly cooked and to acquire their full flavor may vary from five to twenty minutes. The following, however, may serve as an estimate:

Standards .....	9 minutes.
Jacket Pie .....	12 "
Seconds .....	8 "
Peeled Pie .....	12 "

As soon as processed, the cans are removed to a vat of cold water, where they are cooled. They are then stored for a week or ten days, so as to show up any leaks that may occur. These are thrown out and the good cans prepared for sale.

The remainder of the work is merely finishing, and consists in coating the ends of the cans with blue or bronze, to improve their appearance; labeling, for which purpose a good show lithograph should be used; and the final packing in cases, also labelled, for the market.

*Peach Pulp.* Under the previous section of this article we referred more or less to the manufacture of peach pulp, or pie fruit, as it is sometimes called; but, as there has been a considerable interest among fruit growers regarding the matter, and as literature on the subject is scarce and difficult to find, a few additional suggestions may be appropriate.

The particular value of fruit pulp is that it is a cheap means of preserving the inferior fruit that is not good enough for canning; and we are enabled, thereby, to keep it until convenient to make it into jam. At home and where the facilities for canning are not available, all surplus peaches that are sound, whether high grade or inferior, may be utilized in this manner. It is only in the commercial canning factory that the manufacture of pulp is reserved for the inferior fruit.

The main difference between ordinary canned fruit and the preparation of peach pulp is that in the latter there is no sugar or syrup used in its preservation. The peaches should be halved, peeled and cut into pieces, the size of which will depend upon the soundness of the fruit. These are placed into cans of some uniform size, water is added to cover it, and it is steamed, as previously mentioned. Where steaming is not practicable, the lid may be put on as soon as the cans are filled, leaving a vent-hole in the centre. The cans may then be placed directly into the boiling water and cooked until the whole of the contents is raised to boiling point, and all the air in the cans has been driven off. The time required to cook pulp will vary from ten to twenty-five minutes, according to the condition of the fruit being put up. The vent-hole is then closed and the cooking is complete. The cans are examined for leaks the same as for ordinary canned fruit.

In some factories, the pulp is cooked in bulk and stored in barrels. At a more convenient season, it is either sold as pulp or manufactured into jam.

*Home Canning.* The fundamental principle involved in canning, whether at home or in the factory, is that of destroying the germs of fermentation by the application of heat. It is essential that this principle be recognized in order to retain much of the natural flavor and richness of the fruit and to insure its preservation.

Many methods of preserving peaches in the home are practised. One only I shall briefly attempt to outline. After the fruit has been prepared,

as previously described under the head of commercial canning, it is placed in jars before cooking, and covered with syrup. The jars are then put in a large oval boiler or other suitable vessel, having some device to prevent the jars coming in contact with the metal bottom, and being broken during the cooking. Cold water is then added to the vessel till it reaches the neck of the jars. This is slowly heated to the boiling point, at which stage the peaches should be sufficiently cooked. The lids should be put on immediately and the jars sealed air-tight, as the fruit will not keep otherwise.

*Drying.* Canada to-day is dependent almost entirely upon other countries for her dried fruits. This should not be in a favored country like ours, where nearly all classes and varieties of fruit suitable for drying can be grown successfully. True, our climatic conditions will not allow us to compete favorably with those countries that dry their fruits by means of the sun's rays and in the open air; yet, in mechanical evaporation, we have a means at our disposal by which we may materially increase our home production of this commodity, and relatively decrease our foreign importation.

Peaches are dried by three methods, viz., sun-drying, house-drying, and machine-drying or evaporating. The selection and preparation of the fruit is practically the same in all cases, but the after treatment differs in many respects. A full discussion of these methods would require a series of articles; so, in order to keep this section of our article within reasonable space, I shall condense it and treat the subject in a general way rather than attempt a lengthy discussion of details.

*Sun-Drying.* This process is not practicable in Canada, although in some of the peach sections, with proper care and attention at night, it might be practiced to supplement the work of the evaporator. In reality, it can only be depended upon in countries that have long seasons of warm weather, and where the air is dry and the nights dewless.

*House-Drying.* Every peach grower whose means and limited acreage do not warrant the necessary cost of a mechanical evaporating plant, should have one or more simply constructed drying houses. These may be built by any ordinary carpenter in a few days. All that is required is a room, ceiled closely, with rests for fruit racks, having slatted bottoms, arranged all around the walls. A good large stove in the centre of the room, keeping the temperature up to 150 degrees, will dry the peaches in about two days.

*Evaporation.* Probably the most economical and profitable process known for the preservation of peaches is that of evaporation. Peaches dried in a well managed, up-to-date evaporating plant are said to be more nutritious and digestible, to keep better and longer, and to command a better price in the market than those preserved by the sun and the older methods of drying. In order to retain the natural richness and flavor of the fruit, and to insure its preservation, it is necessary to keep the temperature in the evaporator as high as possible without injury to the fruit, and to keep a continuous, rapid circulation of air throughout the compartment.

The peaches should be cut evenly in halves, and the pits removed. If the market price and demand for peeled peaches over unpeeled is sufficiently more to pay the grower for the extra trouble and expense of peeling, they should be peeled. As a rule, most of the dried peaches found on the market are unpeeled. Place evenly on trays or screens with the cut side up.

Whether or not the trays should be submitted to the fumes of sulphur is a matter of taste and opinion. Sulphuring is a bleaching process, and greatly improves the color, especially of old, off-colored fruit. The time allowed should only be long enough to fix the color, as any exposure beyond this will injure the quality of the fruit. To bring about this condition some



growers use a small quantity of sulphur, and expose the peaches for two hours or more, others use a comparatively large amount, and expose relatively only a short time. The exposure differs with the variety, and with the same variety in different conditions, and must be learned by experience. When properly fumigated, the peaches are placed in the evaporator. To secure the best flavor, see that the green fruit is always nearest to the heat, and that the dried fruit comes out at the top. The temperature for drying and the length of time required differs with the different styles of evaporators. In some styles the temperature is kept as high as 200 degrees F. for eighteen to twenty-four hours; in others, more or less as the case may be. The important point to observe in this respect is not the amount of heat, but uniformity. The time required for the peaches to dry properly can only be determined by observation and experience, and the degree of heat.

The fruit should be removed from the evaporator while quite pliable, and not allowed to over-dry. It is then placed in bins or on the floor of the fruit house, turned over occasionally, and allowed to remain until it has passed through the sweating process. It is then graded into various sizes and conditions of color, and packed into clean, uniform packages. The best grades are "faced" in the boxes. Some fair specimens of the fruit to be packed are flattened by running through a wringer or specially constructed pair of rollers. The flattened fruit is placed in the box, cut side down. The box then is filled to the top, the bottom is nailed on, the package inverted and the bottom becomes the top.

The proportion of evaporated from fresh peaches varies with the variety, from five to eight pounds to the bushel is a fair estimate. Peaches should be quite ripe to dry nicely. Early varieties are not satisfactory, as they are too watery, and not well enough matured near the pit.

*Evaporators.* There are many styles of evaporators on the market, from the small family affair, to be set on the back of a cook stove and capable of drying about three bushels of fruit per diem, to the giant factory driers, capable of turning out several hundred bushels daily. Among the latter are horizontal evaporators, towers or stacks, steam tray evaporators, air-blast evaporators, and various others. Before purchasing, a careful investigation should be made, with a view of finding the one of the desired capacity that will produce the best results at the least cost.

Two methods are involved in the process of evaporation; one by the rapid circulation of heated air, and the other by steam pipes laid in horizontal tiers and passing back and forth through the chamber of the evaporator. This latter method is probably the most efficient and economical for very large establishments. The heat is more uniform, more evenly distributed, and more completely within the control of the operator than when hot air is used, and there is less danger of scorching the fruit. The use of hot air, however, is most generally adopted. The apparatus required is less expensive, and with a little care and experience to keep up an even temperature of sufficient heat with perfect circulation, just as good an article may be turned out.

In all hot air evaporators, the heat is supplied by a furnace, below the trays. This furnace is filled with draughts so that the temperature may be controlled. Fresh air is drawn in through specially-arranged inlets, heated, and passed either over or through the fruit on the trays.

In the best forms of commercial evaporators, the fresh fruit is put in at the bottom (i.e., nearest to the heat), and the dried fruit comes out at the top. By means of a mechanical contrivance worked by a crank, the whole stack of trays is raised one notch or space to admit each fresh tray at the

bottom. The fruit is dry when it reaches the top of the stack. The trays are than removed, emptied, refilled with fresh fruit and used again. Thus the system is continuous, and during the busy season such a machine may be worked day and night.

Good machines for use either on a large or small scale can be obtained in Canada. Additional apparatus, bleachers, slicers, parers, etc., also are necessary to the complete equipment of an up-to-date establishment.

*Peach Jam.* Jams are most commonly made from plums and small fruits. A good jam may also be made of peaches when other means for disposing of the surplus are not available. Small and bruised peaches, if used when fresh, may be utilized in this manner—though first-class jam should be made from first-class fruit. The process of jam making noted by the writer is a simple one. The fruit is placed in a steam-jacketed kettle and one-half or three-quarters of a pound of sugar is added for every one pound of fruit. It is then boiled until of the required consistency, poured into cans or jars and sealed down air-tight at once. The English market demands glass jars. When for home use, the jam may be made in any iron or copper kettle, lined with enamel, over a slow fire. If such is used, it is necessary to stir constantly to prevent scorching, and the impurities that rise to the surface should be removed.

*Peach Butter.* This by-product of the peach orchard is made and put up in much the same manner as recommended for jam, differing only in being spiced and in the quantity of sugar used. Large quantities of peach butter are used in England like jam, as a substitute for common butter.

*Peach Jelly.* This is one of the most attractive forms in which peaches are placed upon the market. It is sold at a large profit to the producer, as pure jellies are scarce and high-priced. It is made from pure peach juice and sugar in various proportions, personal and market preferences determining the ratio. Some manufacturers use sugar enough to produce a twenty-degree reading on the saccharometer, others use as high as equal proportions of sugar and juice. Peaches for jelly should be sound and fully ripe. The pits should be removed and the fruit crushed in a press. The juice is then filtered, the sugar is added and it is boiled incessantly for about eight minutes, when it should reach the right consistency: *i.e.*, will keep its shape upended when cold. The jelly is then put up for market in much the same way as recommended for jam.

*Crystallized Peaches.* The production of candied or crystallized fruits is carried on most extensively in California and France. Even in those countries the product is not large, as the process is not a definite one, being more or less in an experimental stage. Wickson's "California Fruits" states that "The theory is to extract the juice from the fruit, and replace it with sugar syrup, which, upon hardening, preserves the fruit from decay, and at the same time retains the natural shape of the fruit. Though the method is very simple there is a certain skill required that is acquired only by practice."

*Brandied Peaches.* In the preparation of brandied peaches, only sound, full-grown, and not quite ripe fruit should be used. Each specimen is wiped clean, and pricked to the centre with a silver or wooden instrument. The fruit is then placed in water heated almost to boiling point, removed from the fire and allowed to stand ten minutes. After heating again, it is thrown into ice-cold water. When cold and drained it is put into a tub of brandy (55 per cent. alcohol) and allowed to stand for six days. Next the fruit is placed in jars. To each gallon of brandy, in which the fruit has been soaked, add four ounces of sugar and heat to 200 degrees F. Fill the



jars containing the peaches with the hot sweetened brandy, and seal air-tight. Store in a dark, cool place. Spice, essence of cinnamon or cloves, may be added to the brandy, before the fruit is put in. This process is recommended by the North Carolina State Board of Agriculture.

*Unfermented Peach Juice.* Peach juice makes a delicious and nourishing summer drink. It is used in the preparation of syrup for soda fountains and it has a wholesome value in cookery. The demand for fruit juices is increasing and is such as to warrant a greater effort on the part of the manufacturer to supply a pure and attractive article. In making peach juice, the fruit is crushed, pressed, and filtered. The juice is then clarified by adding the white of two eggs for each gallon of juice. Then heat nearly to boiling point. After allowing to stand for two hours, siphon off into bottles. Place these in cold water, heat to boiling and seal air-tight. Allow bottles to cool gradually and store in cool, dark, dry cellar.

*Peach Wine.* From time immemorial, sparkling wines have played a prominent part in the celebration of all momentous events and happy occasions. Sparkling wines are made from the juice of black grapes; ordinary wines may be made from the juices of various fruits, including peaches, and even tomatoes. Sparkling wine differs from ordinary wine in that it contains a considerable quantity of carbonic acid gas, which has been retained in the wine by bottling it before the completion of the alcoholic fermentation.

Good sparkling wine is difficult to make. Perfect quality, which depends upon the selection of the raw material and the perfection of the process, is secured only by delicate skill, precision, and long experience. Ordinary wine, sweet or dry, is simple enough to make and may be prepared in the orchard of any peach grower. Quicker and probably more profitable returns may be secured, however, by utilizing the surplus peaches in the cannery or evaporator.

*Peach Brandy:* Sixty years ago, peaches, in many parts of America, were raised principally for distillation. Every peach growing centre had its distillery and every planter had a large share of his crop turned into brandy. Peaches were cheap then and good brandy could be bought for fifty cents and less per gallon. This was before the days of internal revenue. To-day distilleries are few and far between, and peaches are raised chiefly for consumption in the fresh state, and peach distilleries are few and far between.

The following outline, though not complete, will give a general idea of the process: The peaches which should be fully ripe are placed in barrels and mashed to promote fermentation. When doing this, care should be taken not to break the pits, as such when broken and boiled liberate prussic acid which tends to make the brandy bitter. The barrels are allowed to stand eight to twelve days, seldom longer. The pomace is then put into the still, about two-thirds full, and boiled for about three and one-half hours. Boiling may be quicker, but a slow process brings out the most brandy. When the condensed brandy commences to run, it is filtered through charcoal suspended in a keg by means of a double flannel cloth. The first run may be comparatively weak, around 70 proof; the last, usually very strong, about 150 proof; the average, however, will be about the desired standard, usually 100 proof. The liquor is barrelled as soon as distilled, bunged up tightly, and allowed to stand some months before using. Brandy will vary in body and flavor, strength and delicacy according to the richness of the pomace, the amount of care and experience exercised in its manufacture, and the length of time it stands in the wood.

*Vinegar.* Vinegar is generally made from apple and grape juice, although an equally fine article may also be made from refuse peaches. The fruit is placed in casks, mashed and thoroughly broken up, allowed to stand for a sufficient length of time, and the liquid is drawn off into clean casks as it accumulates. In these new vessels it is allowed to stand for some time, and, if sediment settles, it should again be drawn off before finally being put away for use.

*Miscellaneous.* Fallen fruit is unfit for any purpose except as food for hogs or as a fertilizer. Swine turned into the orchard to forage upon fallen peaches not only increase in value themselves, but they also destroy infesting insect larvae and fungous diseases and they add fertility to the soil through their excrement. The particular value of peaches as a fertilizer is not known to the writer. In some peach sections it is a common practice to return the culls and refuse to the soil. Fallen peaches may also be gathered and dried for their seeds.

Peach pits may be utilized by planting in the home nursery or by selling to professional nurserymen who usually pay a good price for selected seed. It is well to observe that pits from the distillery or cannery, where they have been boiled, are unfit for nursery practice. In England, an essence of some kind is extracted from the pits and a very appetizing beverage may be made from them as follows: Remove the kernels from the pits and crush them in water, filter, add sugar to suit taste and boil.

Noyau, a by-product of the peach industry, is "a cordial made from brandy sweetened and flavored with orange peel and the kernels of peach stones, bitter almonds and the like." It is also made by steeping the leaves of the peach in spirits. The leaves yield also a milder liquor that is used for flavoring cookery. The blossoms and the buds yield, by a system of distillation, agreeable and fairly pure perfumes.

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## WINTER SPRAYING.

During the winter of 1901-02, the writer undertook some experiments in the orchards of the Ontario Agricultural College on winter spraying. The work was performed not with the idea of presenting anything new, but to confirm the experiments of Prof. Whitten in Missouri and of Prof. Macoun and others in Canada, and to determine whether or not the advantages in retarding bud growth and aiding tender fruit trees to escape the stimulating effects of warm spells in winter and subsequent injury from freezing, claimed for winter spraying with whitewash, were to be had at Guelph. Should such results be secured, and they have been, a second purpose of our work was to emphasize still further these advantages, and also to draw the attention of Ontario fruit growers more closely to the fact that, in winter whitewashing they have a means at their disposal by which peach trees in peach sections may be grown with less risk than in the past, and a means by which the present peach growing area may be enlarged.

Originally we intended to conduct rather extensive experiments along different lines in this connection, and we may do so yet. Pressure of time and other duties, however, did not allow us to carry out these good intentions. Unfavorable weather conditions stepped in also and spoiled the possibility of definite results in more than one phase of our work. For these



reasons we have decided to confine our remarks to a brief statement of the work done and the results obtained in two lines of the work only; viz.:

1. Retarding bud growth in spring, and
2. The effect of whitewash on the oyster-shell bark-louse.

*Retarding Bud Growth in Spring:* During warm days in February and early spring, peach buds are apt to start into growth and, in the event of subsequent freezing, they are more than likely to be winter-killed. The

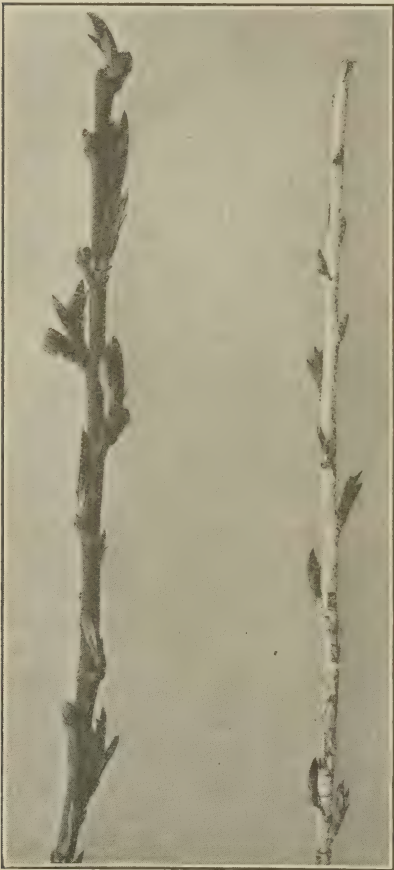


FIG. 15. Hill's Chili peach twigs, unsprayed and sprayed.

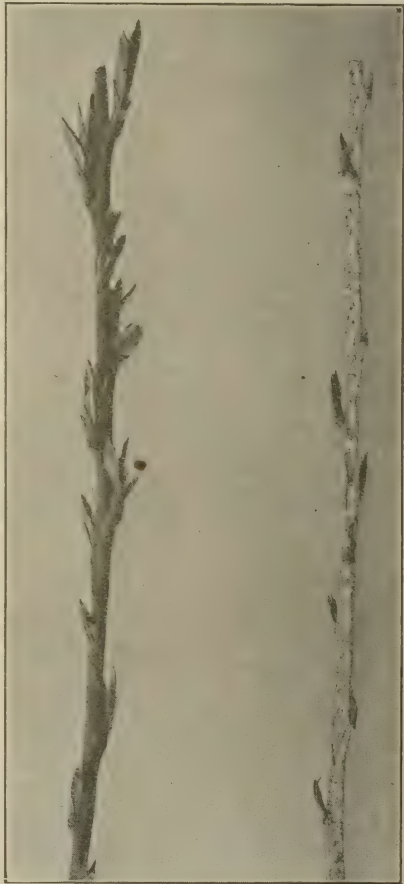


FIG. 16. Bernard's Early peach twigs, unsprayed and sprayed.

best means known to prevent this premature swelling of the buds is white-washing the trees. Whitewash reflects rather than absorbs the heat, and, as a consequence, it holds the buds back and allows them to escape injury from winter-killing. The whitewash should be applied early in winter, giving two coats, and repeated often enough to keep the trees white. The mixture used in our experiments was prepared in the following proportions:

Lime .....	2 lbs.
Water .....	1 gal.
Skim milk .....	1 qt.
Salt.....	5 ozs.

The lime was slaked in a small amount of warm water and stirred so that it would slake well. The remaining ingredients and water were added and the whole was mixed by stirring thoroughly. After straining through a one-twelfth inch sieve the mixture was applied immediately to the trees. The trees selected for this experiment were apples, pears, and peaches. The following table gives the dates of spraying, dates of bud swelling and results.

APPLE TREES.	Date of 1st spraying.	Date of 2nd spraying.	Date of 3rd spraying.	Date of bud swelling.	Results.
St. Lawrence, sprayed..	Jan. 2. ....	Feb. 10 ...	March 15..	April 19...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 16...	three days.
Gravenstein, sprayed ..	Jan. 2. ....	Feb. 10 ...	March 15..	“ 15...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 10...	five days.
PEAR TREES.					
Flemish Beauty, sprayed	Jan. 4. ....	Feb. 10 ...	March 15..	April 28...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 19...	nine days.
Bessemianka, sprayed ..	Jan. 4. ....	Feb. 10 ...	March 15..	“ 26...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 19...	seven days.
PEACH TREES.					
Hill's Chili, sprayed ...	Jan. 2. ....	Feb. 10 ...	March 15..	April 22...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 11...	eleven days.
Barnard's Early, sprayed	Jan. 2. ....	Feb. 10 ...	March 15..	“ 19...	Buds retarded
“ unsprayed ..	.....	.....	.....	“ 14...	five days.

The results of these tests show that whitewashing has a most decided effect upon the relative dates of bud growth on sprayed and unsprayed trees. In two particular cases, Flemish Beauty pear and Hill's Chili peach, the effect is most marked, and may have been influenced partly by other causes and conditions. To more fully appreciate these effects, we have only to glance at the accompanying cuts (Figs. 15, 16, 17, and 18) of twigs from the different trees under experiment. All of them were taken on the same day and are twigs of the previous season's growth.

*The Effect of Whitewash on the Oyster-shell Bark-louse.* In a series of experiments at Ottawa, Macoun found that whitewashing is a promising means of eradicating the oyster-shell bark-louse. The effect of the lime was to loosen the scales and expose the underlying eggs to the action of the weather, and ultimately bring about the removal of the scales from the trees by rain and wind. In the course of the experiments, it was also found that the lime, in itself, did not injure or kill the eggs within the scales, nor was there any noticeable injurious effects from its use on the trees sprayed.

To corroborate these results, in a small way, we sprayed at Guelph two infested Wealthy apple trees with a mixture of lime and water in the following proportion :

Lime ..... 2 lbs.  
Water ..... 1 gal.



The condition of the trees, before and after spraying, and other information is given in the following table. The results obtained are by no

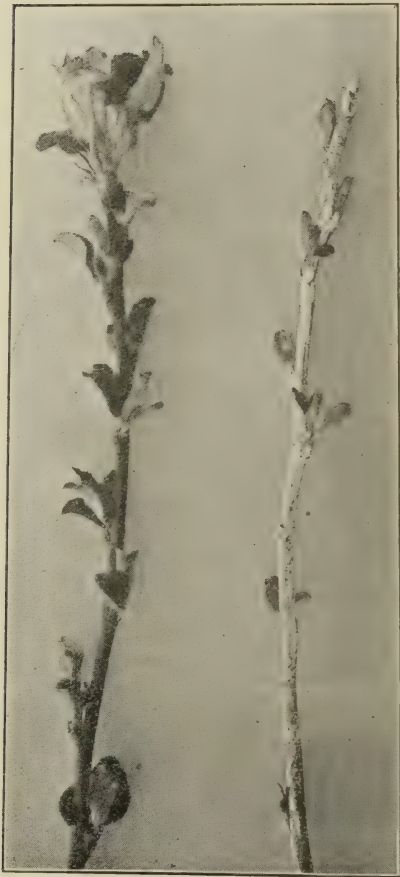


FIG. 17. Gravenstein apple twigs, unsprayed and sprayed.

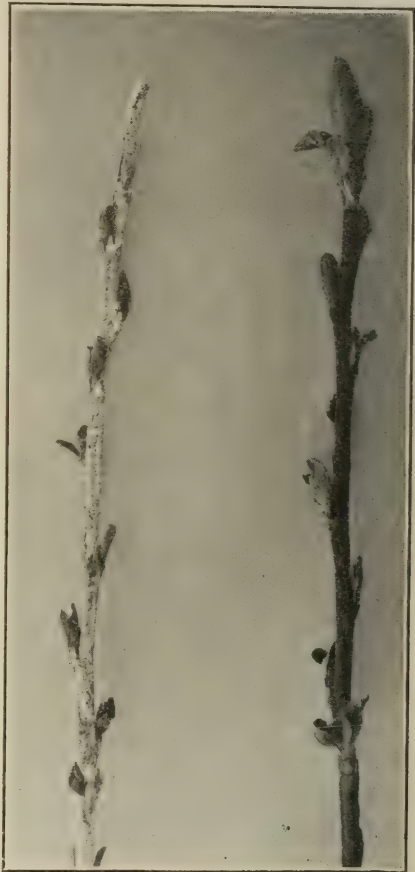


FIG. 18. St. Lawrence apple twigs, sprayed and unsprayed.

means conclusive, as the experiment was limited in its scope, was subject possibly to unfavorable conditions, and was performed but once.

WHITEWASHING TREES INFESTED WITH OYSTER-SHELL BARK-LOUSE.

Before spraying.	1st spraying.	2nd spraying.	Condition April 15, following.	Condition Sept. 15, following.	Remarks.
No. 1. Infested considerably; not badly.	1901. Dec. 31..	1902. Feb. 10..	Infested considerably; no apparent change.	Still considerably infested; a slight decrease in number of scales.	Results poor.
No. 2. Infested badly.	Dec. 31..	Feb. 10..	Still infested considerably, but remaining scales easily removed by slight stroke of hand on limb.	Still slightly infested, but most of the scales had been removed during summer.	Results convincing

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Thirteenth Annual Report

OF THE

Fruit Experiment Stations

of Ontario

UNDER THE JOINT CONTROL OF

THE ONTARIO AGRICULTURE COLLEGE, GUELPH

AND

THE FRUIT GROWERS' ASSOCIATION OF ONTARIO

1906

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TORONTO, 1907



WARWICK BRO'S & RUTTER, Limited, Printers  
TORONTO

To the Honorable WILLIAM MORTIMER CLARK, K.C.,  
*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOR:

I have the pleasure to present herewith for the consideration of your Honour the Report of the Fruit Experiment Stations for 1906.

Respectfully yours,

NELSON MONTEITH,  
*Minister of Agriculture.*

TORONTO, 1907.



## FRUIT EXPERIMENT STATIONS.

### BOARD OF CONTROL, 1907.

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PROF. H. L. HUTT .....	
P. W. HODGETTS .....	Secretary O. F. G. A.

## THE ONTARIO FRUIT EXPERIMENT STATIONS, 1907.

<i>Name.</i>	<i>Specialty.</i>	<i>Experimenter.</i>
1. Southwestern.....	Peaches.....	J. L. HILBORN, Leamington.
2. Essex .....	Vegetables.....	E. E. ADAMS, Leamington.
3. Wentworth.....	Grapes.....	MURRAY PETTIT, Winona.
4. Burlington.....	Blackberries and Currants.....	A. W. PEART, Burlington.
5. Lake Huron.....	Raspberries, Gooseberries and Plums.....	A. E. SHERRINGTON, Walkerton.
6. Georgian Bay.....	Plums.....	J. G. MITCHELL, Clarksburg.
7. Simcoe.....	Hardy Apples and Hardy Cherries...	G. C. CASTON, Craighurst.
8. Bay of Quinte.....	Apples.....	W. H. DEMPSEY, Trenton.
9. St. Lawrence.....	Hardy Plums and Hardy Pears.....	HAROLD JONES, Maitland.
10. Algoma.....	Hardy Fruits.....	CHAS. YOUNG, Algoma.
11. Maplehurst.....	General Collection of Cherries, Peaches, Grapes and Pears for comparative study.....	THE SECRETARY.

### CO-OPERATIVE WORK.

Strawberries.....	Rev. E. B. STEVENSON, Guelph.
Vegetables and Strawberries.....	PROF. H. L. HUTT, O. A. C., Guelph.
Hardy Fruits.....	W. T. MACOUN, C. E. F., Ottawa.
" .....	C. CHAPMAN, Judge, Ont.
" .....	B. BISBE, New Liskeard, Ont.

# Fruit Experiment Stations, 1906.

## THE SECRETARY'S REPORT.

BY LINUS WOOLVERTON, GRIMSBY.

Owing to the uncertainty on the part of the Board with regard to the extent which the Experimental Fruit Farm at Jordan Harbor will take over the work of our present stations, very few new varieties of fruit were sent out to our fruit stations in the spring of 1906.

It is, however, recommended that several of them be continued, so as to work in co-operation with the new station at Jordan Harbor, and test the adaptabilities of varieties to the various districts of the Province. Much valuable information for farmers in Algoma is being obtained at the Algoma stations, and the Board has instructed me to send liberal supplies of promising varieties to Mr. Chas. Young for future experimentation.

Two farmers who have recently settled in New Ontario have applied for collections of varieties for testing there, to see if some fruits will succeed; and the Board has instructed me to furnish them varieties for co-operation. Already we have sent to Mr. C. Chapman, Judge, Ont., the following list which he reported alive in the fall of 1906.

**APPLES:** Transparent, Astrachan, Duchess, McIntosh, Charlamoff, Wealthy, Gideon, Transcendent, Hibernial, Hyslop, Whitney, Martha.

**PLUMS:** Burbank, Chabot, Red June, Hawkeye, Stoddart, Wolf; also some small fruits. A larger and better assortment will be tried next spring.

Among experiments to be conducted at the Jordan Experimental Fruit Farm the Board recommend the propagation of peaches on different stocks, especially upon the St. Julian and the American plum stocks, and have them tested at our various stations to see if peaches so propagated will not withstand the cold in sections such as in Essex, where they are subject to root killing; and also enable fruit growers who have clay soil to grow peaches.

A vegetable experiment station has been opened at Leamington, and the Board has appointed Mr. E. E. Adams, of Leamington, to take up this work. The secretary has been authorised to procure seeds for this work, and to outline the following lines of work for 1907, viz.:—(1) Testing all varieties of early tomatoes; (2) Methods of pruning and training late tomatoes; (3) Varieties of sweet potatoes for profit; (4) Notes on forcing crops; (5) Comparison between sprouted and the sprouted potatoes for planting.

The financial report of the year, as submitted to the Board by the Secretary was as follows:



## FINANCIAL STATEMENT FOR 1906.

Salaries of Experimenters .....	\$1,975 00
Fruit Exhibits, Industrial, \$ 79 11 )	
Massey Hall, 157 42 ) .....	236 53
Travelling Expenses of Inspectors .....	154 43
Photographs .....	12 00
Salary of Secretary .....	300 00
Salary of Inspector .....	100 00
Board Meetings .....	54 37
Committees .....	27 65
Postage .....	10 00
Stock for Stations .....	37 80
Express charges .....	9 85
	<hr/>
	\$2,917 63

## THE DOMINION CONFERENCE.

Acting under instructions from our own executive, and with the permission of the Hon. Minister of Agriculture, I attended the second conference of Fruit Growers of the Dominion of Canada, held at Ottawa, March 20, 21 and 22, 1906.

In comparing notes we found very few present who were in attendance at the First Conference at Ottawa, at which I was also present as a delegate from the Ontario Fruit Growers' Association.

On the afternoon of the second day, His Excellency the Governor-General being present, I was called upon by the Hon. Sydney Fisher to give an address on Fruit Experimental work in the Province of Ontario, and was followed by Prof. F. C. Sears for Nova Scotia; A. T. Peters for New Brunswick; A. G. Glendennan for Alberta; and Martin Burrill for British Columbia.

I gave a summary of our work in the past, and suggested that a Dominion official might collect data on fruits tested in the various provinces for the general good, and might aid in securing a common nomenclature for all fruits grown in the Dominion. Among other things I suggested the advisability of some method of guarding the rights of originators of valuable new fruits, and possibly providing some method of public recognition of valuable services in this direction.

Prof. H. L. Hutt, of our Board, was also present, and gave an account of the co-operative work in fruit accomplished by the Ontario Agricultural College.

## THE HORTICULTURAL EXHIBITION.

At the request of your secretary, the experimenters sent in collections of fruit from their stations to Massey Hall. These arrived on Monday the 5th of November, when your Secretary was in attendance, and secured space for each station. One long table, the length of the basement, was secured for our fruit station exhibit, and was filled from end to end.

I had four signs placed conspicuously upon the table, showing the character of the exhibits, and I was in attendance to answer questions the whole week.

Our bulletin on fruits recommended for planting in Ontario was freely distributed during the fair. I secured several hundred copies from the Department, and gave them to persons who made inquiries regarding varieties for planting.

#### VEGETABLE EXHIBIT.

In response to my request, Mr. E. E. Adams of Leamington, our newly appointed experimenter in Vegetables, was in attendance, and showed a fine collection of vegetables for a first exhibit, which attracted much attention. Mr. Adams was present most of the week to answer questions. The complete list of his exhibit was as follows:

Corn: Stowell's Evergreen (sweet).

Corn: Early Ohio, Smut Nose, White, Yellow and Red Gourd Seed, Little Bailey, Leaming, Yellow Flint, all for field purposes.

Corn: Queen's Golden and Rice for Popping.

Celery: White Plume, Perfection Heartwell, Pearle le Grande, Winter Queen, Triumph.

Cabbage: Late Drumhead.

Carrot: Improved Short White, White Intermediate.

Carrot: Chantenay, Danvers, Ox Heart.

Citron: Green for preserving.

Onion: Giant Rocca, Mammoth Silverskin, Large Red Wethersfield, Prizetaker, Giant of Gibraltar, Yellow Dutch Setts.

Parsnip: Hollow Crown.

Peppers: Long Cardinal, Procop's Giant, Chinese Giant, Neapolitan, Cayenne.

Squash: Red and Green Hubbard, Large Field.

Potato: Gold Coin, Sensation, Rose of the North, Early Rose, Empire State, Beauty of Hebron, American Wonder.

Potato: Yellow Nansemond (sweet).

Water Melon: Halbert Honey.

Pumpkin: Cashaw, New Winter Luxury, Small Sugar.

#### APPLES SHOWN BY SIMCOE STATION.

Of the fruit station exhibits Mr. G. C. Caston's attracted great attention, especially on account of his large pyramid of immense Wolf River apples, from his station in Simcoe County. One lady offered me \$1.00 for a single specimen, to send to Copenhagen, to show what apples we can produce in Ontario. I secured one for her without charge, after the fair closed.

Mr. Caston's Peerless apples were next in importance. This variety has been every year growing in favor with Mr. Caston; until now he speaks of it with considerable confidence as a desirable fall apple for export. It is productive, clean, uniform and beautiful; a seedling of the Duchess. His Gano, too, were especially good. Mr. Caston also rendered valuable assistance in attending at the table during the exhibition. His complete list was as follows:—

Boiken, Hulburt, Gano, Hastings, Blue Pearmain, Canada Red, Steele's Red Winter, Peerless, Baxter, Ribston, Cooper, Bottle Greening, York Imperial, Ontario, Salome, Grimes, N. W. Greening, Large Anis, Spy, Shiasawsee, Pipka, Aport, Shackleford, Winter Maiden's Blush, McIntosh, Greening, Ribston, Alexander, Golden Russet, Wolf River, Blenheim, Baldwin, Stark, Fallawater, Tolman, Fameuse, Ben Davis.



### THE BURLINGTON STATION EXHIBIT.

Mr. Peart showed a large collection of apples, many of them southern varieties of which the Board had sent him scions for testing on old trees. Most of these Mr. Peart reports as of little value for Ontario. He also showed a magnificent collection of currants, raspberries, blackberries and cherries in glass bottles, which attracted considerable notice. Another season, I would advise that shelves be put up for these in such a manner as to bring them near to the eye of the visitor.

At my request the varieties recommended for the Burlington district were shown in large pyramids. The following is a list of varieties shown:

APPLES: Nickajack, Minnesota, Malinda, Houseley's Winesap, Ozark, Highfile, W. C. Limberton, Gill's Red Winter, Bonum, S. Pearmain, Huntsman, Rebel, Gilbert, Wandering Spy, Kentucky Tolenstein, Spy, Baldwin, Greening, King, Seek, Holland Pippin, Esopus Spitzenberg, Blenheim, Golden Russet, Sox Russet, Snow, Swaar.

PEARS: Kieffer, Anjou, Clairgeau, Idaho, Louise, Lawrence, Sheldon.

### BOTTLED FRUITS.

*Blackberries*: Agawam, Ancient Briton, Eldorado, Erie, Kittatinny, Snyder, Stone's Hardy, Taylor, Western Triumph.

*Cherries*: English Morello, Montmorency, Windsor.

*Mulberry*: Russian.

*Currants*: Baldwin, Belle de St. Giles, Black Victoria, Boskop's Giant, Brayley, Champion, Cherry, Collins' Prolific, Crandall, Fay, Lee, Naple, New Victoria, North Star, Pomona, Prince Albert, Raby Castle, Red Cross, Red Dutch, Red Victoria, Saunders, Versailles, White Grape, White Imperial, Wilder.

Also 1 sample of choke-cherry.

### THE ST. LAWRENCE FRUIT STATION EXHIBIT.

Mr. Jones set up a valuable exhibit from his station. He has proved that a very long list of varieties of apples, pears, plums, cherries, and even some small fruits, sent him by our Board for testing, are not adapted for the St. Lawrence valley. A few varieties however succeed to perfection and these he showed in large pyramids, viz: Scarlet Pippin, Wealthy, McIntosh, Fameuse, and Milwaukee. This last variety Mr. Jones has had under favorable notice for some years as a promising commercial cooking apple, and every year becomes more confident that it is a desirable variety for his district. His complete list was as follows:—

PYRAMIDS: Fameuse, Scarlet Pippin, Baxter, Milwaukee, Tolman, Canada Red, Wealthy.

PLATES: Mann, Ben Davis, Golden Russet, Gano, Pewaukee, Pomme Grise, Yellow Bellflower, Downing's W. M. Blush, Blunt, Interacre, N. W. Greening, Aiken's Red, Parling Beauty, Romanstem, Canada Baldwin, Winter St. Lawrence, Clayton, Milding.

### THE ALGOMA STATION EXHIBIT.

Owing to the distance Mr. Charles Young could not come to assist in the setting up of his exhibit, but he sent on to us a box containing a good collection of varieties which had succeeded at his station on St. Joseph Island, where most of the commercial varieties of Southern Ontario are a failure. His list of varieties was as follows:

Pewaukee, Longfield, Winter Arabka, Golden Russet, Colvert, Wolf River, Scott's Winter, Borsdorf, Issam, Sour Seedling, Sweet Seedling, North Star, Gideon, Alexander, Wealthy, Ben Davis, and crabs Martha and Hyslop.

#### BAY OF QUINTE STATION.

Mr. W. H. Dempsey showed twenty-five varieties recommended for his district, out of perhaps one hundred and fifty, a large number of which he has proved unprofitable. Prominent in his pyramids were Stark, Fallawater, Ontario and Seek; varieties that have done wonderfully well in his orchards.

### EXHIBIT OF FRUIT EXPERIMENT STATIONS AT INDUSTRIAL EXHIBITION, 1906.

By P. W. HODGETTS, SECRETARY FRUIT GROWERS' ASSOCIATION.

In accordance with the order of the Board of Control, an exhibit was made at the Industrial Exhibition, not only of fruit as in past years, but also of the various tools used in the industry, samples of the chemicals used in spraying, together with mixtures already made up, devices for protecting trees from sun scald, rabbits, etc., and literature in connection with fruit growing.

The exhibit of fruit was made along the lines of the report of the stations as given in the bulletin on "Fruits recommended for planting in Ontario." While it was not possible to get all of the fruits, still, as far as possible, the recommended varieties were shown on the tables. For instance, in the varieties which are given as the most valuable ones for market as approved by the Board of Control, were shown, Astrachan, Duchess, Gravenstein, Wealthy, Alexander, McIntosh, Fameuse, Blenheim, King, Hubbardston, Greening, Baldwin, Spy, Ontario, Stark.

The same method was adopted in regard to the varieties specially adapted for home use, and also those for hardy districts. There was some trouble, however, in procuring samples of the latter varieties. The same method was followed out with the grapes, peaches, pears and plums. Placards were printed and placed along with the exhibits, giving the varieties and the purpose for which they were intended.

In reference to the fruits which were not in season, such as cherries, currants, raspberries, gooseberries and strawberries, a collection put up in glass by Mr. A. E. Sherrington of Walkerton was made use of as far as possible, while cards giving the full lists were placed with the exhibit.

In reference to the exhibit of tools, through the kindness of Rice Lewis & Son, Toronto, there were on the tables samples of the following:—

Distan Pruning Saw, Little Grant Pruning Saw, Ft. Water Pruning Hook, 17 S & J Pruning Saw, Douglas Saw, 50 Barrel Hatchet, Pair No. 2 Buckeye Pruners, Pair 134x10 Garden Shears, Budding Knife, Pruning Knife, Shears.

Samples of the various chemicals were exhibited, such as Paris green, arsenate of lead, copper sulphate, ferro-cyanide of potash, whale oil soap, flowers of sulphur, etc. These were again shown in bottles in liquid form, as mixed ready for putting on the trees. Paper and veneer coverings for the protection of tree trunks from various injuries, especially in the north, were also shown. Various types of nozzles and other important parts of spraying pumps were very kindly loaned by the various companies interested, and attracted considerable attention.



In regard to these exhibits for another year, I would suggest that those experimenters who are testing the fruits which are out of season at the time of the Industrial, be requested to put up samples this year of all the varieties as recommended by the Board, so that these will be available for this year's Exhibition. By the spending of a little additional money this year, I believe that even a better exhibit than that of 1906 can easily be shown. As the horticultural exhibits will be in one of the largest and most prominent buildings on the grounds, an extra effort should be put forth to make a banner exhibit during 1907.

In addition to the above, copies of the various reports of the Board of Control, the bulletin on "Varieties," Professor Hutt's bulletin on "Apple Culture," and the other fruit bulletins issued by the Department of Agriculture were displayed on the tables and freely distributed to those interested.

---

## REPORT OF THE INSPECTOR OF FRUIT EXPERIMENT STATIONS.

PROF. H. L. HUTT, O.A.C., GUELPH.

The past year has been one of progress and change in connection with the work of the Ontario Fruit Experiment Stations.

Since making my last report, much has been done which will more or less directly affect the continuance of the work at a number of the stations:

(1) The Government has accepted the property at Jordan Harbor so generously donated by Mr. M. F. Rittenhouse, and has now in hand the work of establishing a large fruit experiment station in the Central Niagara District.

(2) At our last meeting a recommendation was made to the Minister of Agriculture, and was, I believe, approved by him, that the stations eventually be reduced in number, retaining those at Trenton, Craighurst, Leamington, and the new one at Jordan Harbor; and that most of the other stations be given from one to two years to complete reports on the varieties now under test.

(3) A Fruit Experiment Station bulletin has been issued giving lists of varieties of fruits of various kinds recommended for planting in different sections of the Province. This bulletin contains in a condensed form the results to date of the variety testing done at the stations during the past ten years.

From this it might appear that the Stations, having accomplished the purpose for which they were established, had now practically completed their work. It must not be forgotten, however, that new varieties of fruits are constantly being introduced, and if we are to keep abreast of the times, the work of testing must be continued and these new varieties will have to be tested and reported upon as soon as possible. As an instance of this we need only refer to the recent introduction of the Spencer Seedless Apple. Here is a new variety of doubtful merit, as yet untried in Canada, being advertised over the length and breadth of the land and sold to Ontario growers at ten times the price of our best standard varieties. If we had no experiment stations for testing such novelties, there might be some excuse for growers generally spending their time and money on such things, but with reliable experimenters in various parts of the country, the general public can save much by looking to the experiment stations to do this testing.

In making my inspection of the stations this year, I have tried to keep in mind what has already been accomplished at the various stations, and to

note what may yet be done by them. In a general way the work of variety testing has been continued as in the past, and each experimenter should be able to report more or less fully upon the fruits he has had under test. These reports are of value, if they add some new information regarding the new varieties which may have fruited, or whether they merely confirm the results given in previous reports.

The weather conditions during the past season have been somewhat unusual, in many parts of the Province. Last winter was exceptionally mild, and fruit trees, as a rule, came through in good condition, although small fruits in the northern parts of the Province, where they usually have the protection of deep snows, suffered more or less from severe freezing when the ground was bare of snow. Last summer severe droughts prevailed in many sections, particularly in the northern and eastern parts of the Province, and for this reason the fruit crop in these sections was far below the average. In some localities as, for instance, in the neighborhood of Guelph, there was an abundance of rain throughout the season, and both early and late crops were excellent. These varied weather conditions will more or less affect the reports of experiments from the different parts of the Province.

Our strawberry experimenter, E. B. Stevenson, of Ponsonby, benefited by the favorable season in the neighborhood of Guelph, and had an exceptionally good crop of strawberries this year. He had over one hundred varieties under test, most of them new varieties not yet introduced to Canadian growers. He has a new plot of one hundred and fifty varieties set out last spring for fruiting next year. In view of the fact that Mr. Stevenson furnishes all his own plants, and that we merely pay him the small sum of fifty dollars for his excellent reports on them, I feel that we can hardly afford to discontinue receiving his reports after another year, as was proposed in the curtailing of the work of the various stations at our last meeting. Mr. Stevenson is doing this work for the love of it, and not for the small sum we pay him for his report, and it rests with us to say if his reports are not worth every year the small sum we pay for them.

In the neighborhood of Walkerton the drought last summer was unusually severe, and crops there suffered to a great extent. At the time of my visit in July to our experimenter, Mr. A. E. Sherrington, the raspberries in his experimental plots were drying on the bushes, consequently, he will not be able this year to furnish a satisfactory report on the varieties under test. It will be remembered that we recommended that two years more be given to complete the work on raspberries and the young orchard at this station. The young orchard in question contains about thirty varieties of apples and thirty-five of pears. The trees have been well taken care of and are just coming into bearing. It is quite evident that it will be impossible for Mr. Sherrington to furnish conclusive reports upon the varieties in this orchard in two years, and if we wish to get such results, we must be content to wait longer for them.

In the report recommending the curtailing of the work of the Stations, no mention was made whatever of the Station of Chas. Young at Richard's Landing, St. Joseph's Island, in Algoma. This station has been doing excellent work for the northern part of Ontario, and Mr. Young has under test a large collection of varieties of different kinds of fruits most likely to succeed in that northern section. The results which he has obtained so far show that with the selection of hardy varieties, fruit growing might be engaged in much more extensively in the northern sections of the Province. I think it is particularly advisable, for the benefit of the northern sections of the Province, that the work at this station should be continued.



The experimental plum orchard of Mr. John Mitchell, Clarksburg, suffered severely during the winter of 1904. The old trees in his original orchard have been nearly all killed. In the young orchard, which contained about fifty varieties, most of the trees still survive, but have been weakened in vitality and bore little or no crop this year, except on the American varieties. It might be well to await results of another year, after which the work at this Station might be discontinued. Mr. Mitchell is now manager of one of the largest co-operative fruit growers' associations in the Province, known as the Georgian Bay Fruit Growers, Limited, and, as his time will now be largely taken up in connection with the co-operative handling of the crop for that section, he will be very glad to be relieved of the experiment station work.

In Eastern Ontario, the drought was probably even more severe than in other parts of the Province, and the apple crop at our St. Lawrence station was the poorest I have seen there during the past ten years. Our experimenter, Mr. Harold Jones, has a young experimental orchard just nicely coming into bearing. He feels that his work will be far from complete at the end of one or two years, at which time it was proposed to close the work at his station. Rather than drop the work in an unfinished state, he has offered to furnish reports, without remuneration, until the varieties in his young orchard have been fully tested, and he has requested that the same be published for the benefit of those in his section.

The new station at Jordan Harbor is expected to take up, in time, the work now being done by the stations at Burlington, Winona, and Grimsby, but, as no planting has yet been done there, it will be several years before we need look for results at the new station. In the meantime, each of the older stations is in a position to furnish valuable information regarding a great many kinds of fruits, for at each of them are large plantations of fruits which have been under test for a number of years.

In concluding this report, I cannot help but refer to the many co-operative associations which have been organized all over the country during the last year or so for the purpose of handling and marketing the fruit crop. This development has largely been the outcome of the co-operative nature of the work of the Fruit Experiment Stations, and many of our experimenters are among the most actively engaged in the new movement. The benefit these organizations are going to be to the fruit industry can hardly yet be estimated, but we are safe in saying that they will many times repay all that has been expended upon the Fruit Experiment Stations.

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# Reports from the Experimenters.

## GENERAL NOTES.

BY A. W. PEART, (*Burlington Station*).

Fruit growing this year has not given a large margin of profit. The winter of 1905-6 was a peculiar and extreme one in some respects. During January there were a few days of warm weather followed by several days of zero temperature. This sudden change, I think, accounts for the absence of plums and peaches in this district.

New plantations of fruit have not started very well. The season was hot and dry at the time of planting in the spring, and there are many gaps, especially among the strawberries and young cherry trees.

New wood appears to be going into winter fairly well ripened. The Tent Caterpillar was not troublesome, but there was considerable fall web worm.

The Canker Worm was not plentiful. Codling Moth was very destructive. There was very little fungus, apples and pears being comparatively clean.

Spraying is becoming more general and systematic. It is being realized that squirting a few quarts of water at a tree is of very little use, but that it is necessary to take pains in preparing the mixture, and spraying it finely and evenly throughout the tree. There are several power sprayers in the Burlington district.

APPLES were a fair crop of good quality. The Codling Moth reduced materially the amount available for export, but there was very little spot. A few odd apples had "ink" marks. In some narrow belts the hailstorm in summer practically eliminated No. 1 stock. Local markets, evaporators and cider mills, however, handled the surplus without waste.

PEARS were a good crop of excellent quality. As a rule they were smooth and clean. The Anjou and Lawrence were especially fine.

PLUMS were a complete failure, Japan as well as domestic varieties. The fruit-buds were probably destroyed by the sudden climatic changes in the winter.

PEACHES were also a failure, probably due to the same conditions.

CHERRIES were an excellent crop of good quality. Early Richmond, Montmorency, and English Morello were exceptionally fine. Spraying appears to be more effective against the troubles of the cherry than any other fruit.

GRAPES were a good crop of desirable quality. Moore's Early and Worden were eminently fine. There was practically no mildew nor black rot, and all varieties ripened.

BLACKBERRIES were a fair crop. All varieties bore more or less fruit. Prices ranged from 7 to 12c. per quart, according to quality and season.

RASPBERRIES were an average crop of good quality.

STRAWBERRIES were a shorter crop than usual and prices higher.

CURRENTS were a light crop. Prices were from 5 to 7c. a quart for red, and 8 to 10c. for black.

BY HAROLD JONES, (*St. Lawrence Station*).

CHARACTER OF THE SEASON.—The winter of 1905-6 was in many ways one of the mildest known to the oldest inhabitant. There was very little



snow and that only in December, and some injury was done to trees and in many cases to the fruit buds by the very warm, spring-like weather of February, followed by the extreme cold in March.

Winter actually set in on November 30th, when plowing was stopped, the temperature going down to 5° F. On Dec. 4th, we had the first snow, 1½ inches falling, which gradually increased to five inches, which gave good sleighing up to January 21st, and from that time until spring the ground was practically bare of covering. The coldest night of the season was on February 5th, when the temperature was 21° below zero. The balance of February was springlike and bright, most of the frost coming out of the ground and the buds on the lilacs and other shrubs starting.

During March we experienced a dry cold month, with the frost gradually penetrating the ground to a depth of 22 inches, and very little moisture in the ground.

The result of this steady cold with no snow or moisture had the effect of injuring many fruit buds and killing out all strawberry beds and many flowering shrubs.

Spring opened on April 16th with the ground very dry, and the last frost recorded was on May 10th.

The plum trees suffered severely in bud, but were not killed. Apple trees came into bud very slowly, not opening until about May 13th, more than ten days later than normal. The continued cold weather through May retarded bloom until the last days of the month.

**INSECT LIFE.**—Insects were not numerous in the spring, but later on in July and August, as the result of very dry, sunny weather and high temperature, all insects multiplied to an alarming extent. The Tussock Moth has been giving some trouble for years, but this year there were no climatic conditions to control the insect and they caused severe damage to the apple crop, biting the young fruit and injuring its quality. The Codling Moth, owing to favorable climatic conditions, continued to multiply in continuous broods from spring to fall, instead of our having two distinct broods, as is usual in this section. As a consequence we may expect to have an unusual number of insects next year, the more so as parasites seemed very much in the minority, and there are egg clusters of nearly all kinds of injurious insects in unusually large numbers. I find that it is necessary to use larger quantities of Paris green with the early sprayings to control the Tussock Moth. They have the habit of eating the terminal growth of the suckers or tender shoots on the inner part of the tree, and also biting the young apple when about the size of a cherry. This deforms the mature fruit, lowering the grade to No. 3 or culls in most cases. For the two sprayings after the blossom falls 8 oz. of Paris green to the barrel of water or Bordeaux can be used with safety and to advantage, provided an excess of lime is used.

**CULTIVATION.**—For profitable results the system of cultivation must be maintained, but cultivation continued towards the end of the season has a tendency to produce a late succulent growth which goes into winter in an unripe condition. I have found the best results obtained by giving thorough cultivation from the time the ground can be first worked in the spring until about the last week in June, at which time a thick sowing of red clover—ten pounds or more to the acre—puts the trees in good condition for ripening up the new wood and hardening off the fruit beds. When the cultivation is continued through the season, the terminal growth goes into winter quarters in a green undeveloped condition, holding the leaves during most of the winter, and is often found shrivelled up and dead in the spring.

In fertilizing the orchard, aim to use a manure that is not too rich in nitrogen. When an excess of nitrogen is used you obtain a vigorous succulent growth that is easily injured, whereas if potash is the chief element, the growth is not so rapid, but the fruit bud is better and more fully developed and bursts in the spring full of stored-up energy and vigour.

By A. E. SHERRINGTON, (*Lake Huron Station*).

Owing to the warm, summer-like weather last January, considerable damage was done to fruit trees and bush fruits. In January the weather was so warm that the buds started into growth; then the temperature dropped to twenty below zero, practically killing all of the fruit buds and, in most cases, the leaf buds on the plum and all of the Duke and English cherries. This is the first case of the Japan plums being injured by winter frost. The plum crop here was a total failure. Morello cherries were a good crop, or would have been if the birds had let them alone. The apple crop has been very satisfactory, the fruit clean, medium in size, and all harvested and marketed at good prices, thanks to the co-operative movement. The yield of bush fruits was not equal to last year, being about one-third less; this was owing to winter conditions and the very dry summer.

The co-operative movement has done much towards the improvement of the fruit trade, especially in apples, as more apples and other fruit has been sold at the shipping point than heretofore; a more uniform grade and better pack having been the results of co-operation. This co-operative movement, if conducted along right lines, will in a short time place the fruit industry of this country on an equal with, if not superior to, the Dairy industry.

INSECTS AND FUNGI.—Not, in my experience, has the Codling Moth been so destructive as this season. A great loss has been sustained from the ravages of this pest. The past season teaches us that a more systematic cleaning up and spraying of the orchards of Ontario will have to be practiced before this troublesome insect is banished. Less fungi and apple spot was found this season than for many years; nearly all varieties were clean and free from scab.

Fire, or twig blight, was quite prevalent in some orchards; at this station a few pear trees in the Experimental plots were killed.

Very little planting was done at the station last spring, in fact no stock was furnished by the Department. All blanks, where trees had been killed or died, was filled in with the same variety, or in some cases new sorts were planted. A few new plums, pears, gooseberries and currants were added to the list by the manager. Considerable attention is being paid to top grafting, both in apples and pears, to ascertain if any improvement in hardiness, early bearing, or quality of fruit can be brought about by this method.

By J. G. MITCHELL, (*Georgian Bay Station*).

Taking it as a whole, this has been a very good year for the fruit growers of this district. Although PLUMS were a complete failure, and, for reasons not very well accounted for, APPLES, the main crop, were exceptionally good, very fine and clean and particularly well colored. Prices were about \$1 per barrel on the trees, or \$1.25 if picked. Many of the growers are taking the co-operative plan and handling them themselves, which is entirely the best way.



CHERRIES were also an abundant crop, of the very finest quality. Prices being well maintained, they were a very profitable crop. Small fruits are grown here for local requirements only, which was quite strong, still there was sufficient for all demands and the quality was very good.

FUNGI and INSECTS were very little in evidence this season, only the Codling Moth doing much damage, and this mostly in the uncultivated or unsprayed orchards. There has been a great deal more care of the orchards since the advent of co-operation. Growers are finding that the orchard, if properly managed, is the best investment they have, and will pay the largest dividend on the time and labor expended.

By G. C. CASTON, (*Simcoe Station*).

Many of the apple trees in this section, my own included, are seriously affected with Oyster Shell Bark Louse. I intend to try the lime whitewash, but I have more faith in a thorough scrubbing with lye. The whitewash is an easier method, if it is only as effectual.

I think a trial should be made of arsenite of lead at the stations as a poison for Codling Moth and leaf-eating insects. Something that will stick better than Paris green is needed to be effective against these pests, especially in a rainy season.

By J. L. HILBORN, (*Southwestern Station*).

Some EARLY RICHMOND CHERRIES are grown here, and, as usual, were a fairly good crop but owing to the rainy weather at the time the fruit was ripening, it was soft and juicy and did not ship well. Much complaint was received from receivers of this fruit that it arrived in a wasty condition, and would not stand up. This variety is not very satisfactory either to the grower, dealer or consumer. The MONTMORENCY is an excellent variety here and yields a good crop almost every year, and is very satisfactory to all, but the leaf spot has been very bad on all varieties of sour cherries the last few years, and unless some remedy is found to check it, serious results to this crop are imminent. SWEET CHERRIES of nearly all varieties were an excellent crop and ripened up in good condition.

By C. CHAPMAN, JUDGE, ONT., (*New Ontario*).

I have received the following list of trees for testing in this locality, viz.: APPLES, Transparent, Astracan, Duchess, McIntosh, Charlamoff, Wealthy, Gideon, Transcendant, Hibernial, Hyslop, Whitney, Martha.

PLUMS: Burbank, Chabot, Red June, Hawkeye, Stoddart, Wolf.

These trees are doing well, and looked well at the beginning of the winter. I have wrapped them with tar paper to keep the mice away. I am doing everything I can to make them succeed, and I think they will. A lecturer from the O. A. C. has seen my fruit plot and says I have the best object lesson fruit planting in Northern Ontario. The small fruits have not done so well, but dried up a good deal in arrival, through delay in transportation.

# APPLES.

NOTES BY W. H. DEMPSEY, (*Bay of Quinte Station*).

...

The apple crop has been very disappointing again this year. The crop being so light last year, the growers were counting on a heavy crop this year, and were still holding out hope when the trees came into bloom, as the amount of bloom was not very heavy, which in the past has been an indication of a fair crop; but the bloom dropped and the embryo fruit also, leaving a very medium crop of fruit to be still further thinned out by the ravenous worms and insects. Probably the most destructive of the evils were the Codling Moth and the Fungus, while in a few localities the Apple Maggot was also very destructive, commencing on the early varieties such as Astrachan, Duchess, Wealthy, and on down through the winter varieties, leaving its mark of destruction as the varieties came into condition for it. These attacks caused the fruit to color prematurely and fall to the ground. Some growers were under the impression that the fruit was ripening on account of dry weather, but when carefully inspected, the cause was discovered. I think the loss to some orchardists from it alone would be fully 50 per cent. of the crop.

The only remedy I know of is to gather the fruit and destroy it.

Where the grower did not follow up careful spraying the trees suffered very severely from the Oyster-shell Bark-louse, which seemed to find the weather conditions most favorable for it. Many young orchards will be almost worthless from the effects of it.

Where trees were grown very rapidly, making a somewhat spongy growth, the Fire Blight appeared, causing a goodly portion of the foliage and young growth to die.

Ink Spot helped materially in supplying apples for the evaporators, probably more conspicuous on Greening and Tolman. Apple spot was very bad in uncared-for orchards on Snows.

The man who takes pride in his orchard and thoroughly sprays and cultivates it, does a great work in maintaining the name for Canadian apples, and should have all the assistance that can be given him. This has been brought more to my notice this season through the co-operative work that I have been connected with. In such instances it was possible to ship 90 per cent. of the apples; where not specially cared for less than 50 per cent. could be exported on account of fungi, Codling Moth, Curculio bites, which caused the apple to be irregular in shape and very poor even for the evaporator or canning factory.

Probably the only remedy for this condition is the co-operative company for handling these products, where each grower gets pay for just such fruit as he produces. If he grows number one, he gets number one pay; while if content to grow a large per cent. of No. 2 and culls, his income will be accordingly low. This can never be remedied by the so-called apple buyer who buys by the lump, good, bad, or indifferent; the pay is the same for all. But the evil does not stop here; the buyer is going to try and make a large percentage of No. 1's out of those and escape the Government inspectors if he can, and get them on the foreign market and destroy the demand for the good, honest, straightforward packs that are being put up by the careful growers and co-operative associations.

We notice these unscrupulous buyers trying this more and more every day, putting on grade marks of A, B, C, in place of Nos. 1, 2, and 3,



pretending they are shipping locally to have them repacked in U.S.A. before going forward; but fortunately very few have got past our wide-awake inspectors in this way.

It is pleasing to note the number of fine orchards in the most choice locations, as a rule with natural drainage, which have been carefully pruned and cultivated, while a few orchards that were planted in very unsuitable locations simply because it was more convenient to the buildings, are in an unhealthy condition, having cold, wet sub-soil water standing on the surface until late in spring. One of the greatest drawbacks in this district is the poor choice of varieties the growers have made for their particular locations; for example, the Jonathan, an excellent dessert apple, but far too small for profit, averaging about two inches in diameter.

One orchard had fully one hundred barrels of Golden Sweet; it was impossible to market them in the short time that they were in prime condition.

MANN is not very productive; the trees sun scald badly, making an unsightly appearance alongside of other good varieties. ST. LAWRENCE fruits heavily but very little of the fruit is perfect, making a small percentage of No. 1's and is seemingly not wanted in foreign markets; besides I notice many other varieties that are not suitable for these locations.

SPY seems to be doing well in nearly all the orchards.

GOLDEN RUSSET is not doing well except in a few orchards; it seems to require special location and conditions. The best I saw was on a point running out in the Bay of Quinte, exposed to the heavy winds. The soil is a clay loam, the fruit was very large, rich golden in color and showing a large percentage of No. 1.

BEN DAVIS was found in every orchard but is not a success in all; but I think it comes the nearest to being a success in every location of any variety. The locations where it was not doing well was apparently a cold and wet subsoil, where frost comes early in fall and late in spring, or on very dry gravel but where little moisture is maintained during the growing season.

The other varieties similar to Ben Davis, such as Cooper's Market and Gano, averaged far too small to be of any value compared to the former and seemed to be more subject to the different diseases common to the apple.

CRANBERRY: In a few locations that seemed suitable, this variety gave remarkably fine crops this season and sold very readily at good prices; but in other locations I found old trees that have never done anything.

BLENHEIM: Seems to be another variety that needs a special location to be profitable. I only found one block of them that did anything this season and that was on top of a high hill, soil a clay loam apparently no different from any other except it gave the finest fruit to be found in this locality.

TOLMAN SWEET: Seemed to be in all the older orchards and fairly well loaded, but fully 90 per cent. of the fruit was defective on account of the many insects and fungi affecting it. I have had great difficulty in disposing of them at fair prices, although they are the best all round sweet apple that I know of.

BALDWIN: This is a variety that has not been so largely planted as one would expect, and, like the Cranberry, seems to require a special location to be profitable. In a few orchards the ESOPUS SPITZENBURGH was doing remarkably well, bearing a good crop for the season of that good old rich high quality apple brings good prices in the markets. It would certainly pay the grower, where they can grow it successfully, to plant more of it and less of the poorer kinds.

In Rawdon Township I found several orchards of that beautiful apple the MCINTOSH RED, which are certainly very profitable; the fruit was of very large size, high color, and equal to any I ever tasted in quality, which sold at good prices, also the FAMEUSE (SNOW) were equally good in the same orchards.

There was one small block of BAXTER that was fairly well loaded with large, highly colored fruit, but when packed nearly half of the bulk had to go to the evaporator on account of fungi and Codling Moth.

KING seems to be one that will not pay; I find it in the most favored locations and yet without fruit. I only had about thirty barrels in the twelve thousand handled this year, which is extremely small for the number of trees.

GREENING in many orchards bore well, but the fruit in some sections was badly infested with ink spot which made it only fit for the evaporator; in other orchards it was practically clear and sold at a good price for this year.

What few trees of GRAVENSTEIN I saw were fine; it is one of the fall apples that has been neglected; not planted as largely as it deserves, being of high quality and productive each alternate year.

There were a very few small blocks of LONGFIELD; it was a great mistake that they were ever introduced into this section; the tree is a very slow grower on account of its fruiting heavily; the fruit is small, more like crab-apples, too small for the evaporator and of very poor quality; unless heavily thinned it is not worth growing in this section.

FALLWATER: Not very many trees grown, only found in a few orchards, and as a rule the tree shows sun scald and unhealthy conditions. It produced a fair amount of fruit which was badly infested with Codling Moth and Fungus. Many medium sized apples turn a bright lemon yellow color that were green when picked, but become mellow and punky after being in the storage for a month, causing a great waste. I would not recommend planting it with the idea of shipping it for the winter markets.

NONSUCH was doing fine wherever it had any chance, and sold at good prices; it requires to be picked early and, like the Cranberry, it falls to the ground early.

DUCHESS were very fine in nearly all locations and sold for good prices; it paid the grower well.

WEALTHY as a rule ran very small on account of overloading, making probably one-half not fit for shipping; it would pay well if the growers were to thin it, taking off one-half the crop when the fruit is half grown; the balance would increase in size enough to make the same number of barrels.

The crop of apples in the experimental orchard was a failure.

AIKENS RED: Only two apples, but the crop of 1905 kept well and were very fine in March; it is of medium size, bright red, and of good quality.

BANANA: Bore a few apples which were bright as usual; the fruit of 1905 was in good condition in March, and of good quality.

COO'S RIVER: One apple; the fruit of last year kept very good through January in the fruit house, but did not retain its quality.

MILDING: Still making vigorous growth but no apples.

SUTTON'S BEAUTY: Is making very slight growth; unhealthy in appearance; very few apples; fruit of 1905 did not keep well later than January; quality no better than Baldwin.

YORK IMPERIAL: Not fruiting; 1905 apples were in good condition in April; think it would take well on the markets, but it has not been very productive either top grafted or in trees.



WINTER MAIDEN'S BLUSH: Very few apples; the fruit of 1905 did not keep through January and was of medium quality.

The fruit buds of the cherries, plums and peaches were all winter killed, therefore no specimens this year. Trees all in fairly good condition except peaches, which were frozen back.

NOTES BY HAROLD JONES, (*St. Lawrence Station*).

The following notes are on varieties not reported in 1904-5:

AIKEN'S RED: Planted 1897; tree fairly hardy; a wide, spreading grower; dark green foliage; fruit, small, dull red, of fair quality, but subject to spot; not desirable.

BLUNT: Planted 1897; a round, compact, vigorous, healthy tree; hardy, ripening its wood well; fruit, large, 3 to 3½ inches, yellow, striped and splashed with red; a nice looking apple, not prolific as yet.

BOIKEN: Planted 1897; fairly hardy and vigorous, but has not proved of any value yet.

CANADA BALDWIN: Planted 1896; continues to show great vigor and hardiness, but comes into bearing slowly. If this tree proves prolific, it will be valuable for this section, as the coloring is very high, and it is an attractive apple on the market.

CLAYTON: Planted 1897. This tree is not vigorous, and its fruit shows no desirable qualities.

DOWNING'S W. M. BLUSH: Planted 1896; tree vigorous, upright, but does not ripen off its wood well; fruit, medium to large, waxy white, with blush similar to Fall Maiden's Blush.

FANNIE: Planted 1897; tree upright, slow grower, injured to some extent every winter, not hardy.

GANO: Planted 1900; tree and growth similar to Ben Davis; fairly hardy, but shows some injury to terminals; fruit very highly colored and very attractive; worth further trial.

HURLBUT: Planted 1896; a fairly hardy, vigorous tree, but fruit of no value; undesirable in this section.

MILWAUKEE: Planted 1896; this tree maintains its many desirable qualities. It has been giving me annual crops since 1901, and has come through the severe winters just passed without any injury whatever. The fruit is green, splashed with dull red at harvest time, but later takes on a bright yellow and brilliant red in the storehouse; a prime favorite as a cooking apple all winter, keeping well through March. I consider this apple a valuable addition to our limited supply of winter fruit, and it will no doubt be largely planted when its qualities become better known. Can be classed as desirable.

MAGOG RED: Planted 1896; tree an upright, moderate grower; fruit undersized for the variety and poorly colored; not desirable here.

MILDING: Planted 1897; a spreading, fairly vigorous tree; hardy; fruit medium to large; promising.

N. W. GREENING: Planted 1896; tree fairly vigorous, forming a round, compact head; fairly hardy, but not ripening its wood well at the tips; fruit dull green, sometimes with faint blush; uneven in size, running from small to very large; of fair quality, but unattractive in appearance; of no special value.

PARLING BEAUTY: Planted 1898; tree vigorous and hardy, forming a close, compact head; fruit large and handsome; worth further trial.

**ROMANSTEM:** Planted 1898; a close, compact tree, with slender twig; fruit of poor, undesirable appearance and quality; of no use in this section.

**SALOME:** Planted 1896; tree hardy, compact, round close head; fruit small, undeveloped and poor in quality; not desirable.

**SWITZER:** Planted 1897; a hardy, vigorous tree, coming into bearing early; season about the same as Duchess, and of no value compared with that variety.

**SHACKLEFORD:** Planted 1897; tree of only moderate vigor; fruit small, poorly colored and greasy; not desirable.

**WOLF RIVER:** Planted 1896; a hardy, vigorous tree, of promise; a fair crop of large to very large, handsome apples; an apple that extends the season of the Alexander, and one that sells well on the market; a good show apple and in demand for decorating shop windows; hardy and promising.

**WINTER ST. LAWRENCE:** Planted 1896; tree a vigorous, healthy grower; comes into bearing slowly; fruit medium to large; attractive and promising.

**WINDSOR CHIEF:** Planted 1896; tree of poor vigor and injured to some extent by frost; not very promising.

Desirable varieties for St. Lawrence Valley, according to season:—  
Yellow Transparent, Brockville Beauty, Russell, Duchess, Chenango, Alexander, Wolf River, Wealthy, Scarlet Pippin, Fameuse, McIntosh, Baxter, Canada Baldwin, Blue Pearman, Milwaukee, Golden Russet, Scott's Winter. The following varieties are not recommended:

Aikens' Red, Blenheim Pippin, Betchel's Crab, Clayton, Downing's W. M. Blush, Dartmouth Crab, Fannie, Gideon, Hamilton, Hurlbut, Hibernial, King, Longfield, Late Strawberry, Mann, Magog Red, Mammoth Black Twig, N. W. Greening, Ontario, Onion Crab, Palouse, Roman Stem, Salome, Sutton's Beauty, Shackleford, Waxon Crab, Winesap, Yate's Red.

#### NOTES BY A. W. PEART, (*Burlington Station*).

In 1901, thirty-nine varieties of Southern State apples were sent here in the form of scions. These were top-grafted on four trees of Roxbury Russet. Six varieties failed to grow, and of the remainder, twenty-six varieties bore fruit this year, as follows:—

**BELMONT:** Apple small to medium in size, roundish flat; yellow; stem medium length, cavities shallow; flavor sub-acid, moderately juicy; no spots; some Codling Moth; fair looking; season, early winter. Yield, 6 qts.

**BONUM:** Very small; red; stem long, cavities shallow; oblong-round; sub-acid; no spots nor worm holes; very few apples. Season, late winter.

**COFFET:** Small; yellowish-red; short stem; roundish-flat; sub-acid; very few apples; no spots; wormy; poor looking; late winter.

**CULLESAGO:** Small; sooty yellow; long stem, medium cavity; sub-acid; wormy; no spots; poor looking; very few apples; season, early winter.

**GILL'S BEAUTY:** Red, slightly tinged with yellow; small; roundish; long stem, shallow cavity; skin fine-grained, flavor sub-acid; no spots; very few worms; rather a good looking apple; season, mid-winter; few apples.

**GILBERT:** Small; round; yellowish-red; long stem; sub-acid; wormy; no spots; very few apples; not attractive looking; season, late winter.

**HATCHELL'S SEEDLING:** Very small; dark red; roundish conical; medium skin; sub-acid; very few apples; season, late winter.

**HUNTSMAN:** Medium size (about that of Baldwin); roundish-flat; slight-



ly ribbed; very yellow skin, slightly mantled with crimson; medium cavity; stem medium length; flavor, sub-acid; rather handsome apple; no spots; some worms; very few apples; season, mid-winter.

**HANSELEY'S WINESAP:** Small; roundish conical; medium stem, medium cavity; red; sub-acid; spongy; neither worms nor spots; yield, 36 quarts; good-looking; season early to mid-winter; clings tenaciously.

**HIGHFILE:** Small to medium; roundish conical; short stem; dark red, covered with rich purple bloom on the sunny side, like that of the black grape; very attractive and handsome; drops rather easily; flavor, sub-acid; no spots; a few worms; season, early winter; yield, 18 quarts; a promising variety.

**KENTUCKY TOLENSTEIN:** Medium to large; roundish-flat; yellow striped with bright red; slightly ribbed; long stem; cavity medium; sub-acid, pleasant flavor; no spots; no worms; only a few apples; a striking, attractive looking apple; season, mid-winter.

**L. S. PEARMAIN:** Flat; small to medium; short stem; yellowish red; sub-acid; medium cavity; some spots and worms; yield, 6 quarts; season, mid-winter.

**LITTLE'S RED WINTER:** Small; roundish flat; long stem; red, marked with slight yellow; medium cavity; sour; juicy; some worms and spots; few apples; fair looking; season, early winter.

**MINNESOTA PIPPIN:** Small; oblong-round; very short stem; yellowish red; sour; some juice; no worms; some spots; yield, 24 quarts; season, early winter.

**MAMMOTH PIPPIN:** Small to medium; yellow; sub-acid; cavity medium; short stem; fine-grained skin; few worms; no spots; very few apples; season, early winter.

**MILAM:** Small; yellowish red; medium stem; moderate cavity; roundish flat; sub-acid; no spots nor worms; very few apples; late winter.

**MALINDA:** Very small; dull red; cavity medium; medium stem; round; sub-acid; few apples; season, late winter.

**NICKAJACK:** Medium size; roundish flat; red, mottled with yellow; cavity moderate; stem medium; sub-acid; few worms and spots; yield, 6 quarts; fair looking apple; late winter.

**OZARK:** Small to medium; rich, dark red color; stem medium; cavity moderate; skin fine in grain; roundish conical; sub-acid; some worms and a few spots; a handsome apple; yield, 1½ bushels. This apples hangs very tenaciously, and this year promises well; season, mid-winter.

**PENNSYLVANIA RED STREAK:** Small; yellow, striped with red; short stem; sub-acid; roundish flat; some worms; no spots; few apples; season, early winter.

**RED LIMBERTWIG:** Small; greenish red; oblong; medium stem; shallow cavity; sub-acid; some spots and worms; yield, 12 quarts; unattractive looking; season, mid-winter.

**REBEL:** Small to medium; roundish flat; yellowish red; long stem; moderate cavity; sour; juicy; some worms and spots; few apples; good looking; season, early winter.

**WANDERING SPY:** Medium to large; red; cavity deep; stem medium; roundish; sub-acid, pleasant; small core; no spots; very wormy; rather good looking; yield, 3 quarts; season, late winter.

**W. C. LIMBERTWIG:** Small; roundish conical; reddish yellow; stem long; cavity shallow; sub-acid; a few spots and worms; fair looking; yield, 6 quarts; season, mid-winter.

**YELLOW HORSE:** Medium to large; smoky-yellow; roundish flat; slightly ribbed; cavity very shallow (almost like Pewaukee in that respect); very short stem; drops badly; sub-acid; juicy; good flavor; not attractive looking; few apples; season, early winter.

Of the above varieties the only ones that were promising are the Ozark, Highfile, Hansley's Winesap, and Kentucky Tolenstein, the Ozark being the most so of any.

All of the apples appear to be hardy, and most of them of a sub-acid flavor and lacking in juice. At the present time (Nov. 26th), all seem to be winter varieties.

#### NOTES BY G. C. CASTON, (*Simcoe Station*).

There is comparatively little to report that is new this year; but some notes on varieties that have been under test for some time may prove interesting and valuable to those who intend planting fruit in this district. There was nothing received for planting here this season except a new variety of raspberry called the Eaton, which is referred to elsewhere. The apple crop was very irregular in this locality and lacked uniformity. Some orchards were fairly well laden, while others were almost barren. This irregularity applied to all varieties of winter apples, rather than early kinds, as Duchess and most varieties of fall apples were fairly good. All kinds of apples were cleaner than usual, even Snows were much freer from fungus scab than they usually are.

##### Notes on varieties of Apples:

**SPY:** The king of all the winter apples; the most saleable of all apples in the home market. I would say to all intending planters, plant hardy, healthy, thrifty-growing trees, and top-graft them with Spy. When they come into bearing you will have an apple that will never go begging for a market. This is the advice I gave twenty years ago, and I would emphasize it to-day. I have them doing well on Yellow Transparent, on Haas, on Wealthy, on a dozen varieties of Russian, on Pewaukee, and on Tolman Sweet. I would recommend the latter especially as a stock for top-working Spy on. The most unsuccessful I have tried are Astrachan and Russet. Do not use them when better ones are available. But to grow fancy Spys, top-grafting is not all of it. Regular pruning, cultivation, spraying and feeding with proper manure, are all essential. But the more fine Spys you have the better you can sell, and the more money you will get. They always help to sell your other apples. The Spy is a good investment.

**BALDWIN:** I am growing this apple top-grafted on Russian and other stock. I don't believe it will ever do as well as the Spy here, even top-grafted. The extremely cold winter of 1903-4 gave some of them a severe set-back, while top-worked Spys were unscathed. However, they are coming along nicely now, and some of them are beginning to bear, but I believe a few years' further test will indicate fairly well just how well the Baldwin will do here top-worked on hardy stock.

**KING:** Does it pay to grow Kings anywhere? I doubt it. While top-grafting improves its bearing, making it more productive, yet it is hopelessly discounted by the Spy in bearing.

**GREENING:** Does well top-grafted, and this good old variety has not lost its popularity, and is not likely to as long as it can be grown of good quality. And that is simply a question of top-grafting, spraying, pruning and proper tillage in this locality.



**GAÑO:** I still like this variety better than Ben Davis, to which it is no doubt closely related, although in my estimation a much better apple.

There are two varieties of winter apples not much noticed in any former report, that I think now to be well worthy of consideration. One is Steele's Red Winter. This would be a good substitute for the Baldwin where that variety cannot be grown, as it is quite hardy, and while not of high quality, it is a good shipper, and will keep till June. The other is the old "Seek," which does fairly well here, and will do exceedingly well when top-grafted, and is a very saleable apple of good quality.

**YORK IMPERIAL:** This is one of the new varieties that are promising. It has borne a few specimens this year, and promises to be a useful winter variety. If it should prove to be desirable as a good market apple, it should be top-grafted, as the tree is tender.

**BOIKEN:** I am still pleased with this variety. It is sure to be a profitable kind, as the trees started to bear two years after planting, and have borne regularly ever since. The tree is fairly hardy and the apple is a good shipper, and will keep as long as Ben Davis. The quality is only fair, but its keeping and shipping qualities, coupled with its early and regular bearing, would commend it.

**SHACKLEFORD:** I see that Mr. Dempsey places this one on the list of undesirable varieties. I will not do that yet, but designate it as promising here, and worthy of further trial.

**MCINTOSH:** This cannot be said to be a success here. It does not bear regularly, and it is one of the worst varieties for scab, worse, even, than Snows.

**SHIAWASEE BEAUTY:** I regard this variety as the best of the progeny of the Snow, and will prove an excellent substitute for that variety. About the same season as the Snow, it bears well; the fruit is clean and much larger, and although it has not the Snow flavor so distinctly as Louise or the McIntosh, yet it is an excellent Christmas dessert apple. I think, as it has had several years' trial, it is safe to recommend it to intending planters as an excellent substitute for the Snow.

**WOLF RIVER:** This is going to prove a profitable apple for this section. A very healthy, thrifty, hardy tree, bears early, a good yielder. Fruit very large, but smooth, clean, and takes on a beautiful color, and is an excellent cooker. The fact that I intend planting a number of trees of this variety in the commercial orchard indicates what I think of it.

**CANADA BALDWIN:** This variety fruited a few specimens this year. I would call it promising, but it needs further trial.

Two Russian varieties fruited this year which might prove useful for localities farther north, as they are hardy. One called LARGE ANIS is of the Alexander type, but later; the other, PIPKA APORT, is above medium size, flat in shape, skin dark green, overspread when ripe with dark red, and would keep till midwinter. They are not recommended for this section, as there are many varieties of the same season and of better quality growing here.

**NORTH-WEST GREENING:** A promising variety; needs further trial.

**PEERLESS:** A seedling of Duchess, and one of the very best cooking apples on the list. A clean, handsome apple. Season, September-October.

**MARTHA:** In Crab apples, I have fruited a dozen more varieties, and my preference is for the Martha. Good for culinary purposes and clean, bright, handsome in color.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

As stated in general notes, apples were a very satisfactory crop, and with the exception of the Codling Moth, the crop was harvested and disposed of at good prices. The only difficulty in this District, as no doubt in all others, we have too many undesirable varieties for successful apple culture. The crop at the Station was a very heavy one, quality good, a few more of the new varieties fruited this season.

BISMARCK gave a barrel per tree; this variety is of the Alexander type, but a better keeper.

NORTHWESTERN GREENING, about one barrel per tree, of large well formed apples, but the quality is rather poor, color green, undesirable for market, either home or foreign. Tree vigorous and hardy.

STARR, fruited for the first time; fruit large, resembles Colvert, but quality much better, season a little earlier.

SHACKLEFORD, produced a few samples of fine appearance; tree vigorous, and hardy, but the quality of the fruit is too low for it to ever become a profitable market variety.

STARK, fruited for the first time; fruit large, resembles Colvert, but hardy, and an early bearer, but the fruit is not equal in color to the Ben Davis, quality about the same.

None of the newer sorts are equal to the old standard varieties, and in my opinion, if we had more of such varieties as the Baldwin, Spy, King, and a few others, it would mean thousands of dollars to this country.

The trees top grafted are all doing well, and some interesting information may be looked for in course of time.

NOTES BY J. G. MITCHELL, (*Georgian Bay Station*).

This has been a very good season for apples, and we have had a great many varieties in bearing. So far as this district is concerned, there are none of the new varieties which can displace the best of the old well tried kinds.

As experimenter, and having had thirty years growing apples, also buying and handling in a large way, I have often been asked to recommend what to plant. Location and conditions are so different in even a limited area that it is scarcely safe to advise. For my own planting in commercial orchard I would use the following: Gravenstein, Baldwin, Spy, and Mann, with a few Ben Davis. The last four are the long keepers, and the real money makers of the orchard. Not only do they sell for the highest prices, but they bear enormous crops which many others of fairly good quality seldom do.

NOTES BY CHAS. YOUNG, (*Algoma Fruit Station*).

The past season, including the winter of '05-'06, has been peculiar in one respect; in everything, except plums, the show of blossom in the spring was good; with the exception of a frost after the buds began to swell the weather for setting fruit was favorable. About the usual proportion of fruit set, but began to drop and continued so through the season. Fall fruit was a full crop, but winter fruit was poor in quantity, although the quality was good. We are still looking for that first class winter apple, but it has not turned up yet. The old saying that Hope deferred maketh the heart sick, does not hold good in our case, but acts as a spur to further exertions,



and the want of a so-called winter apple is not so great a want after all as it might appear to those in the most favored fruit sections. When I state the fact that on the 26th day of March, 1906, we finished the last barrel of Alexanders in perfect condition for dessert and of a finer texture and better quality than those grown in the south, you will see that, even if we have to depend on ourselves, we are not so badly off after all. Since I commenced fruit-growing in Algoma, 23 years ago, I have made several mistakes. Knowing this to be a cold country in winter, I located my orchard in what I considered a nice sheltered valley on naturally dry soil; that was my first mistake. The next was planting varieties that we have since found to be useless here. About that time the tree agent came round and often, to get him out of the house, I would purchase a few trees; by and by the little sheltered hollow was filled up and the trees were planted on higher ground. They did, and have continued to do so, very much better on the high ground, that I have always advised planting on the highest ground, without actually selecting a hill top. Another mistake was planting a wind break; it was all right for a few years, but now the spruce, of which it was composed, are 40 feet high, and are destroying the rows of fruit trees next to them. A wind break is desirable, but should be kept well away from the fruit trees. Another mistake, which it took several years to be convinced, was the idea that by working a tender variety on a hardy stock that the top would be sufficiently hardy to endure the frost in winter; this I am now satisfied is not the case. A Baldwin top on a McMahon stock remains a Baldwin top still and no hardier than on its own root as far as a frost resisting power is concerned. This good may result,—a trunk, liable to sun scald, may be made better by working on a hardy stock. Another mistake, it is quite possible to have the ground too rich in nitrogen in a young growing orchard; a long sappy growth is the result with wood not fully matured before winter, which is absolutely necessary in a cold climate. I have lost several trees from this cause. I have about forty varieties of winter apples top grafted principally on Longfield, mostly Russians, doing nicely, besides some local seedlings. We may get something out of them.

I would like the Board to send me scions of Milwaukee, Boiken and Peerless for top grafting. I would also like to try again Spy and Ontario. These last, although frozen out in the winter of 1893-4, I am not satisfied to discard. If the Ontario does freeze down once in twenty or twenty-five years, it bears so early, and has, until this winter, been so satisfactory, that I find nothing to take its place. I propose top working it on McMahon or Longfield stock. I also want to try the Herbert Raspberry.

From your long experience in the Niagara district you know just what varieties bring the most money per tree, but here we are just finding this out. An immense quantity of apples were shipped from the dock here last fall at prices of \$2.25 to \$2.50, buyers finding the packages and paying freight, 11 qt. baskets of Astrachan and Duchess Transparent at 25c. to 35c., including basket.

Between what was put on last spring and this spring I will have about 100 varieties, all coming on together, which will give me a better opportunity of observing the individual behavior of each than if the work was spread over a long series of years.

I have delayed replying to your letter for this reason: For some years, on the 20th day of March, I have sampled apples kept over winter just to find out their keeping qualities; they have all kept in an ordinary cool cellar under the house; the fruit was not selected, only no apple showing bruise was allowed; the following are a few results that may interest you:

ALEXANDER: Past its best for eating, still fit for cooking.

WOLF RIVER: Very good eating, will possibly keep nearly a month longer.

GOLDEN RUSSET: Skin all shrivelled up, slack in the package, not satisfactory, do not think this apple matures sufficiently.

McINTOSH: Good up until the end of February, slightly past its best now.

PRINCESS LOUISE: A most satisfactory apple every way, in fine condition now, this should be added to our list for Algoma.

SNOW: Past its best, 50 per cent. decayed.

LONGFIELD: All good, but the apple is too small for market.

SCOTT'S WINTER: Will keep for months yet, but too small; not profitable to grow.

GIDEON: 4 per cent. rotten at the core, past its best.

SWITZER: Nearly all gone; no use to keep over.

These are a few of the principal kinds grown here, and this report may interest you in regard to their keeping qualities when grown in the north.

A select list of varieties of apples for cooking in the Algoma District, named in order of ripening: Yellow Transparent, Charlamoff, White Astrachan, Red Astrachan, Duchess, Oriel, Basil the Great, Alexander, Wolf River, North Star, St. Lawrence, Wealthy, Gideon, McIntosh.

Late Winter: Scott's Winter, Golden Russet, Arabka, Baxter, Pewaukee, Princess Louise, a winter apple here. To this may be added Milwaukee and Northwest Greening, but I have not fully tested them yet.

A list of varieties of apples not considered worth further cultivation in the district represented by the Algoma Fruit Station: Spy, King, Baldwin, Tolman, Blenheim Orange, Rolf, Sweet Bough, Ben Davis, Stark, Bismarck, Mann, Rhode Island Greening, Fourth of July, Early Harvest, Lady.

### UNDESIRABLE FRUITS.

In addition to the list of apples enclosed, and taking a commercial view only, I would include all Grapes, Pears, and Blackberries. For these the general market will have to depend on a supply from further south. To a limited extent or for private use a few of each may be grown. There is always a certain amount of pleasure, not to be counted by dollars and cents, in growing your own fruit for your own table.

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### BLACKBERRIES.

NOTES BY A. W. PEART, (*Burlington Station*).

To the UNDESIRABLE VARIETIES reported in 1904 the two following ones are also added:—Early King, as being too tender, and Humboldt, as being too small as well as tender.

The HARDY VARIETIES are Agawam, Ancient Briton, Eldorado, Stone's Hardy, Taylor, Snyder, Western Triumph, Wachusett.

COMMERCIAL LIST: Ancient Briton, Agawam, Snyder, Taylor, Western Triumph.



**AGAWAM:** Cane, dark red, vigorous, upright grower, hardy and productive; berry roundish, oblong, medium size; first and last ripe, July 31-Aug. 20; yield per row, 18 feet, 6 quarts.

**ANCIENT BRITON:** Cane, dark red, moderately vigorous, upright, hardy and productive; berry oblong, conical, medium size; first and last ripe, July 28-Aug. 10; yield, 18 feet row, 7½ qts.

**ELDORADO:** Cane, brownish red, upright, spreading, medium vigor, hardy and fairly productive; berry medium to large oblong, conical; first and last ripe, July 31-Aug. 20; yield, 18 feet, 4½ quarts.

**ERIE:** Cane, greenish red, moderately vigorous, spreading, slightly tender but productive; berry medium to large, roundish, conical; season July 31-Aug. 20; yield, per 18 feet, 5½ qts.

**HUMBOLDT:** Cane, reddish green, upright, tender, medium vigor; berry long, slender, small to medium; first and last picking, July 20-Aug. 5; yield, per 18 feet, 4¾ quarts.

**KITTATINNY:** Fully described in report of 1904; first and last picking, Aug. 5-Aug. 25; yield per row, 5 quarts.

**SNYDER:** Also fully described in report in 1904; first and last picking, July 28-Aug. 18; yield per row, 7 quarts.

**STONE'S HARDY:** Cane, brownish red, strong upright grower, hardy and productive; berry oblong, oval, small to medium; first and last picking, Aug. 2-22; yield per row, 4½ quarts.

**TAYLOR:** Cane, greenish red, moderately vigorous, upright, spreading, hardy and productive; berry medium, oblong oval; first and last picking, Aug. 2-20; yield per row, 5 quarts.

**WESTERN TRIUMPH:** Cane, dull red, strong grower, upright and hardy, very productive; berry medium oblong, round; first and last picking, Aug. 2-20; yield per row, 7 quarts.

**NOTE.**—A row of bushes 18 feet in length is taken as the basis of yield in all of the above varieties.

Blackberries do not succeed up here; they either winter kill or suffer with the drouth in the summer. Two varieties are doing very well, Eldorado and Snyder.

**ELDORADO:** Plant, strong and vigorous, half hardy, fruit large, without a core, quality good to best; yield, 109 oz.; ripe Aug. 6th.

**SNYDER:** Plant, vigorous and hardy; fruit, small to medium, rather dry and hard; yield 166 oz.; ripe July 6th.

#### NOTES BY G. C. CASTON, (*Simcoe Fruit Station*).

All small fruits, with the exception of strawberries, were a failure this year. Blackberries did well here up to the cold winter of 1903-4, but have never done as well since. This year the absence of snow and the soft, unseasonable weather of January, followed closely by hard, cold weather, so injured the blackberries that they bore little or no fruit. This is a vexatious business, when one spends time and labor pruning and cultivating, and gets nothing for it. However, given our usual quantity of snow, and an average winter, I quite hope the blackberries will again do well. For the first few years of fruiting, I had some crops which could not be excelled for quantity and quality. I am only growing two varieties, Agawam and Eldorado, and I do not feel like discarding either of them yet. Agawam is the hardiest of the two.

NOTES BY CHAS. YOUNG, (*Algoma Station*).

Blackberries have never been satisfactory. I made a mistake in planting by setting a double row along a fence, where the snow covered them five feet deep in winter. I did this with the idea of protection from frost. That part was all right, but in spring, when the thaw came, the heavy weight broke the canes off by the ground, the few berries that did form usually dried up before they ripened. I have selected two varieties, which I consider the hardiest and most likely to succeed, Eldorado and Agawam. In 1905 I received Snyder, Kittatinny, Erie and Gainor, and planted them in what I consider a more favorable location, topped the canes and cut the laterals back in the fall. They have made excellent growth, and went into winter in fine shape. I hope to be more successful, but, in the meantime, I am satisfied that commercially they will not be a success here and I would not advise planting any of them. Even if successful there is no present demand for the fruit.

## CHERRIES.

NOTES BY LINUS WOOLVERTON, SECRETARY FOR ONTARIO FRUIT STATIONS.

The Cherry crop has been more satisfactory this season than for two seasons past. Two of the worst evils of the cherry orchard were almost lost to sight, viz., the aphid and the rot. In some orchards the aphid has been reported, but in our experimental plot not one is to be seen, a great contrast with some other years in which they were so numerous as to render the crop almost worthless.

The rot has not been so little troublesome for years; why, I cannot tell. Frequent rains are usually assigned as the cause, but these have been as frequent as ever and yet we have fairly good fruit. Even the Bigarreus, a class most of all subject to rot, have this season given us a large percentage of clean fruit.

Spraying with Bordeaux is yearly becoming more and more highly appreciated as a remedy for rot. This season is the first in which I have harvested really fine Windsors. It is the most subject to rot of all the Bigarreus, and I had been deeply disappointed over them, having planted an acre to this variety alone. This season's experience makes me think I can save them by faithful spraying. I only gave them one application, but that was a thorough one, just after the fall of the blossoms. On several unsprayed Windsor trees the fruit was entirely worthless from rot, and no attempt was made to gather the fruit, but a plot of 100 trees that had been thoroughly treated yielded a good crop of magnificent cherries.

This season I laid down a part of the cherry plot to grass, but I am not pleased with the result. Montmorencys in sod gave much second grade fruit, while those in well cultivated soil were fine. Such very vigorous growers as Schmitz, Yellow Spanish and Windsor may succeed in grass, on sandy loam, for they go very much to wood if highly cultivated, but for slower growers I would favor the best of cultivation.



The old notion of planting cherry trees in the fence corners only and leaving them to shift for themselves is exploded. Cherries are a profitable crop and it will pay to give them the best of treatment.

Scarcity of labor for harvesting our fruit in Ontario, makes it unwise to plant too freely of any one kind. The wisest plan is to plant so as to have a constant succession, and thus employ a certain number of hands with some degree of regularity the season through. In cooking cherries I would plant about equally of the following three kinds to cover the whole cherry season, viz.: DYEHOUSE, which is earlier than the Richmond, and ripens about the middle of June; the MONTMORENCY, the great main crop pie cherry, coming in about the first week in July, and the ENGLISH MORELLO, ripening about the middle of July. The later is not so much in favor as the other two; still it is an excellent cooking cherry, and prolongs the shipping season about a week. This will give a month of cherry picking, and will occupy a gang of pickers from the close of strawberry season until raspberries are well upon us.

The picking of the cherry crop is the great bugbear in the way of growing it on a large scale; and yet a full crop of cherries is as easily and as quickly gathered as the same number of quarts of strawberries, barring, of course, the climbing. The usual cost of picking cherries is 15 cents an eleven-quart basket, when the crop is an average one; if not, about 20 cents.

Of the English cherries, it is a perplexing task to make out a list of varieties that are permanently desirable. They behave so differently in different seasons that one's ideas concerning their merits this year may be wholly changed next year. During the past forty years I have been growing a large number of varieties for both domestic and market purposes, and yet I am ever learning new pointers about them, and find my list of favorites becoming frequently modified.

For profit my favorites just now, to cover the season, are: Wood, Knight, Tartarian, Napoleon, Spanish, Elkhorn, and Windsor, named in the order of ripening.

For domestic purposes I would add Elton, Reine Hortense, Late Duke, Choisy and Schmitz.

#### NOTES ON VARIETIES.

The following notes are taken from my pocket note-book, made during the season in the orchard:

ABESSE: Morello, imported from Russia, 1883, by Prof. Budd. Tree, slow in coming into bearing, and even then unproductive; fruit, dark purple; flesh dark with red juice; subject to curculio; ripe June 15th to 20th; of no commercial value.

BRUSELER BRAUNE: Morello; no crop; ripened about 20th July.

CHOISY: Duke; ripened June 20th; tree vigorous, unproductive; short lived; fruit medium large, red, very rich, sweet and delicious; valuable for the amateur.

CLEVELAND: Heart; ripened June 20th to 25th; tree vigorous, usually productive, but this year a very small crop; very similar to Wood.

COE: Heart; ripened end of June; tree vigorous and productive; fruit large, pale yellow with rich sweet delicate flavor, but too tender to be popular as a commercial sort.

CONNECTICUT BLACK HEART: No fruit.

**DOWNER:** Sweet cherry; ripened beginning of July; not productive enough; color, red; flesh rich, sweet, melting and tender.

**DYEHOUSE:** Kentish pie; harvested June 20th; tree very productive; trees bent down with weight of beautiful fruit; fruit perfect; no rot, no curculio; a trifle earlier than Richmond and likely to displace that variety.

**EAGLE:** Heart; harvested July 10th; trees very vigorous, not productive; yield 1906 better than usual; fruit nearly black; flavor rich and is excellent quality for dessert; not valuable commercially.

**EARLY PURPLE:** Heart; no crop; not profitable.

**ELTON:** Bigarreau; followed Wood about June 26th; tree vigorous and productive; fruit pale yellow with red cheek, with sweet, excellent flavor; inferior to Wood and more subject to rot; quickly softens on reaching maturity.

**EUGENIE:** Duke; season about third week in June; no crop; not very productive.

**HORTENSE:** Duke; ripened July 1st; a very small crop of magnificent samples; seems to be too irregular in bearing to be profitable in the commercial orchard; one of the very finest for the home garden.

**IDA:** Sweet cherry class; ripened end of June; tree medium productive; fruit not very large, much taken by birds; not profitable at this station so far.

**KNIGHT:** Heart; ripened June 25th to July 1st; tree very vigorous and very productive; long lived, one tree at this station nearly fifty years of age, gave crop of six bushels; fruit large, reddish purple, sweet and excellent; no rot, no curculio; not subject to attack by birds; one of the best of the black cherries.

**LATE DUKE:** Duke; ripened first week of July; tree vigorous, upright, not very productive, no crop 1906; one of the finest of the Dukes for the home garden; resembles Royal Duke in experimental plot.

**LUTOVKA:** No crop; seems not to be very productive.

**KOSLOV:** A Russian Morello, with fruit very similar to English Morello, but the tree is a dwarf.

**DIKEMAN:** Late black Bigarreau of medium size; a long keeper.

**MAGNIFIQUE:** Duke; ripened 18th July; gave a very small crop; seems to be only moderately productive; ripens unevenly.

**MAY DUKE:** No crop.

**MERCER:** Fruit resembled Governor Wood, perhaps another name for the latter.

**MEZEL:** No crop.

**MONTMORENCY:** Pie; ripened 10th July; the last picking about 15th July almost worthless on account of curculio and rot. This is unusual with this variety, for in previous years it has hung a week after maturity without waste. Trees sprayed were much less subject to rot and curculio than those not sprayed. The fruit commanded ready sale at \$1 a basket.

**MONTMORENCY ORDINAIRE:** Similar to Montmorency.

**MORELLO:** Ripened 18th to 20th July; sometimes miscalled the Wragg, which is the old English Morello under a new name; dark red with colored juice; yielded a fair crop; trees somewhat recovered from the blight of 1905; a good commercial variety because it comes into the market when all other varieties are over.

**NAPOLEON:** Bigarreau; ripened first week in July; a good crop and less subject to rot than usual. When it can be grown free from rot, it is the most productive of all cherries, and the largest in size, unless perhaps we except the Yellow Spanish.



OHIO: Ripened end of June; a failure.

OLIVET: Duke; ripened the end of June; a fine large cooking cherry, but the crop was very light; the trees have never yet borne more than a half crop, and they have been planted ten years.

OREL 23 (in our previous reports by error called Orel 28): ripened about end of June, about with Richmond; a fine yield of red, sour cherries, equal to Montmorency; tree very hardy. We judge it would be one of the best for profit in northern sections.

OSTHEIM: Scanty crop; did not pay for picking.

PURITY: Pie; ripened end of June; a magnificent crop of clean fruit with few or no blemishes; tree loaded with fruit was a most attractive sight; possibly Dyehouse, sold under another name.

RICHMOND: Pie; ripened about middle of June; wasted rapidly where not quickly gathered and marketed; very much grown for market, but too perishable to be planted for principal crop; widely distributed from Richmond, Va.; Hogg thinks it a synonym for the Early Kentish; tree very productive; but apparently not very long lived.

ROCKPORT: Bigarreau; ripened last of June; usually very subject to rot, but this season we harvested about two-thirds of a crop of No. 1 cherries; the flavor is subacid and not nearly equal to that of Wood; we do not recommend this variety.

ROYAL DUKE: Duke; ripened last of June and beginning of July; very few cherries on the tree; usually an abundant bearer, and I count it the best of the Dukes for all purposes.

SCHMIDT: Heart; ripened first week in July; a failure so far as quantity is concerned; my trees, ten years planted, have borne scanty crops every year, so that the variety cannot be profitable; judging, however, by the size or beauty of the fruit and its excellent quality and high flavor, it has no equal as a dessert cherry, and should find a place in every garden for family uses. The fruit is jet black, of the largest size and high quality. Tree very vigorous (10); productiveness poor (4).

SKLANKA: No crop.

SPANISH: Bigarreau; ripened first week in July; a great success this year; it is usually very subject to rot, but is comparatively free this year from rot or curculio. Many of my trees are now nearly fifty years of age, and have reached a very large size. They have yielded very little sound fruit, for two or three seasons past, but this year gave a fine crop of beautiful cherries of the very largest size. This fruit is far the finest of the white Bigarreaus. The color is light yellow, with a blush on the sunny side.

STRAUSS WEICHSEL: Duke; ripened end of June; not profitable in the southern parts of the Province; tree shows itself fairly vigorous but not very productive; fruit dark crimson in color; juice colored; quality good; useful at the north on account of its hardiness.

SCHATTEN AMARELLE: Synonym for Shadow Amarelle.

SHADOW AMARELLE: Morello; ripened 10th to 15th of July; tree vigorous; shy in bearing so far; may be valuable on account of its late season.

SUDA HARDY: Morello; ripened first week in July; fruit resembles English Morello; tree fairly productive; quality medium.

WINDSOR: Bigarreau; ripened 10th to 20th of July; trees are very vigorous and productive; on old trees not sprayed the fruit was a perfect failure from rot, but on young trees thoroughly sprayed with Bordeaux, the crop was very good; fruit large to very large, fine for eating fresh, but not a good cooking variety, because flesh remains tough and clings to the pit after cooking. Probably this variety has been too much boomed.

WOOD: Heart; ripened about 20th of June; trees in my old orchard now fifty years old, and beginning to die, yield about 40 quarts of good fruit per tree, with about as many more spoiling with constant wet weather, or stolen by the birds, which are yearly becoming more troublesome; very little rot on these trees, which were thoroughly sprayed; the finest early dessert cherry, and profitable for market; sold for 75 cents per eleven-quart basket.

WRAGG: Practically another name for English Morello.

NOTES BY A. E. SHERRINGTON (*Lake Huron Station*).

The fruit buds of the Duke and English varieties were all killed, hence no crop, but the Morello class yielded a good crop where the birds did not take them. The best varieties for the district are: Early Richmond, Montmorency, Ostheim, English Morello, ripening in order mentioned, but English Morello and Montmorency are the two most reliable varieties.

I cannot give any report as to yield, as so many were taken by the birds.

NOTES BY J. G. MITCHELL (*Georgian Bay Station*).

We had this season the finest crop of cherries in years, with such varieties as Windsor, Mary Duke, Ostheim, English Morello, Montmorency, Yellow Spanish, Early Richmond, Olivet, and the Common Red and Black.

These varieties are too well known to need description, and all of them are doing well, except Yellow Spanish, which is rather tender. Montmorency, Olivet and the Common Red and Black are the most profitable, and also the most reliable with us, in about the order named.

NOTES BY G. C. CASTON (*Simcoe Station*).

None of our cherries fruited this year. Some of them have not recovered from the effects of the winter of 1903-4, but no doubt the principal cause was the peculiar weather of last winter. For the first time in many years we had no snow, and the lack of this is a serious thing for the fruit here. The latter part of January the weather was unseasonably mild and open, so much so as to start the sap in most of the trees. Following close on this came the coldest week of the winter. Twice within a week the mercury went 24 degrees below zero. The result was injury to cherries and plums, both in roots and fruit buds; in fact, the fruit buds were so destroyed so that both cherries and plums were a failure this year. I would not advise planting the cherry for commercial purposes here at all. It would be a very uncertain business, and not at all likely to prove profitable. A few trees of the Morello class for home use is all I would recommend.

NOTES BY HAROLD JONES (*St. Lawrence Station*).

My report on cherries must be very brief, owing to the crop being a complete failure. There were a few blossoms on Orel, Ostheim, and Montmorency, but on examining them they were found to be all destroyed in the pistil.

Such varieties as Orel, Ostheim, Vladimir, Montmorency, Early Richmond, and E. Morello, are quite hardy here in wood, but the fruit bud suffers to such an extent that it is a very doubtful crop.



NOTES BY CHAS. YOUNG (*Algoma Fruit Station*).

With this fruit I can congratulate myself on being somewhat successful, the more so in that, when I first began with them, I had little hope of success. I do not mean to say that every year there is a full crop, but every year there is a fair crop of sour cherries. I had the impression, when I first planted, that the most suitable soil was that inclining to sand; I have since found this to be a mistake and have them growing on from light sandy loam, resting on a sand bottom, to stiff red clay, and, while avoiding either extremes, I have had decidedly the best success on rather stiff clay, having plenty of fall to carry the water off. My best trees, carrying the heaviest and surest crops, are on this soil, with a full northern exposure, and I may say having a full sweep of wind, clear across Lake Superior.

The varieties I would recommend are Early Richmond, Orel, Montmorency and English Morello. I can see no difference as regards hardiness. Ostheim has never produced a sufficiently full crop; it is a fair cherry to eat out of hand when fully ripe, but is no hardier than any of the others. At a distance of several miles from any large body of water, I find this fruit is not to be depended on. Whether it is absence of moisture or the effects of spring frost on the buds I am not prepared to say; perhaps both combined.

All the sweet cherries, without any exception, that I have tried, are not sufficiently hardy. The tree may live for several years, but I have had no fruit to speak of. I am now trying a few, headed so low that the snow will cover them over in winter. Late Duke and Elkhorn are, so far, sufficiently hardy.

## CURRENTS.

NOTES BY A. W. PEART (*Burlington Station*).

**COMMERCIAL LIST.** *Red.* Cherry, North Star, Prince Albert, Victoria, Wilder. *Black:* Collin's Prolific, Naples, Saunders. *White:* Grape and Imperial.

**UNDESIRABLE VARIETIES**, not further described, but fully reported in 1904: Crandall, Belle de St. Giles, Brayly, Raby Castle, Red Dutch.

Following are descriptions and notes of varieties revised to date:—

**BALDWIN:** Planted, 1903; fair grower; fruit, medium size; sub-acid, black; first and last ripe currants, July 20, Aug. 10; yield, one quart per bush (average of six).

**BLACK VICTORIA:** Planted, 1903; strong grower; fruit, large to very large; sub-acid; first and last ripe July 15, Aug. 5; yield per bush, 1 1-2 quarts.

**BOSKOP'S GIANT:** Planted, 1903; strong grower; berry, black; large to very large; acid to sub-acid; first and last ripe July 10-30; yield, one quart per bush.

**BEAUTY:** Planted, 1903; very strong grower; berry, black; medium to large; sub-acid; first and last ripe July 20, Aug. 10; yield, one quart per bush.

**CHAMPION:** Planted, 1904; moderate grower; fruit, black; large to very large; sub-acid; first and last ripe July 25, Aug. 15; yield per bush, one quart.

**COMET:** Planted, 1903; moderate grower; fruit, red; acid; medium to large; first and last ripe, July 10-31; yield per bush, one quart.

**CHERRY:** An old standard variety that holds its own with newer varieties; fully described in report of 1905; yield this season per bush, three quarts; first and last ripe, July 5-31.

**COLLINS' PROLIFIC:** Planted, 1898; very strong grower; productive; berry, black; large to very large; sub-acid; first and last ripe, July 20, Aug. 10; yield per bush, three quarts.

**FAY:** Also an old standard variety, described in report, 1904; first and last ripe, July 10-30; yield per bush, two quarts.

**LEE:** Fully described in 1904; first and last ripe, July 20, Aug. 10; yield per bush, 1 1-2 quarts.

**NAPLES:** This old variety is scarcely superceded by the newer ones; average yield per bush, 3 1-3 quarts; first and last picking, July 20, Aug. 6.

**NORTH STAR:** Planted, 1896; strong grower; productive; fruit, medium to large; acid; first and last ripe, July 15, Aug. 5; yield per bush, average, two quarts.

**PERFECTION:** Planted, 1903; moderate grower; currant, medium to large; acid; red; first and last ripe, July 10-30; yield per bush, one quart.

**POMONA:** Planted, 1907; Moderate grower; fairly productive; red; medium to large; sub-acid to sweet; first and last ripe, July 10-30; yield per bush, three quarts.

**PRINCE ALBERT:** Planted, 1897; a strong and productive grower; very acid; first and last picking, July 15, Aug. 15; yield per bush, three quarts.

**RED CROSS:** Planted, 1896; strong grower; not very productive; fruit, red; medium to large; sub-acid; first and last ripe, July 10-30; yield, one quart per bush.

**RED VICTORIA:** Planted, 1896; bush very vigorous and productive; berry, medium; acid; first and last ripe, July 10-31; yield per bush, three quarts.

**SAUNDERS:** Planted, 1897; a strong productive grower; berry, black, large; sub-acid to sweet; first and last picking, July 20, Aug. 10; yield per bush, two quarts.

**STANDARD:** Planted, 1903; strong grower; fruit medium; black; sub-acid; first and last ripe, July 15, Aug. 5; yield, 1 1-2 quarts per bush.

**SUCCESS:** Planted, 1903; moderate grower; black; sub-acid; medium size; first and last ripe, July 12, Aug. 5; yield, one quart per bush.

**VERSAILLES:** Planted, 1896; moderate grower; not productive; berry, red, medium size, acid; first and last ripe, July 5-30; yield per bush, two quarts.

**WHITE GRAPE and WHITE IMPERIAL:** Fully descr'bed in previous reports; the former as the more productive, the latter of the finest quality.

**WILDER:** Planted, 1896; strong productive grower; currant, red, medium to large, sub-acid; first and last ripe, July 10, Aug. 5; average yield per bush, 2 1-2 quarts.

**NOTE.**—Currants generally were not so productive this year as the average.

Comparative yields of currants for years 1902-1906 inclusive, with average per bush per year:—



COMPARATIVE YIELDS of Currants for years 1902-1906 inclusive, with average per bush. per year.

	1902.	1903.	1904.	1905.	1906.	Five years.	Average per bush. per year.
	Quarts per bush.	Quarts per bush.	Quarts per bush.	Quarts per bush.	Quarts per bush.	Total.	
*Baldwin.....				$\frac{1}{4}$	1		
Belle d' St. Giles.....	$2\frac{1}{2}$	$1\frac{1}{2}$	1	1	2	8	$1\frac{1}{2}$
*Black Victoria.....				$\frac{1}{4}$	$1\frac{1}{2}$		
*Boskop's Giant.....				$\frac{1}{4}$	1		
†Brayley.....	3	4	$2\frac{1}{2}$	4	2	$15\frac{1}{2}$	$3\frac{1}{10}$
*Beauty.....				$\frac{1}{4}$	1		
Champion.....	3	4	2	3	2	14	$2\frac{1}{2}$
*Comet.....				$\frac{1}{2}$	1		
Cherry.....	$4\frac{1}{2}$	$5\frac{1}{2}$	4	5	3	22	$4\frac{1}{2}$
Collins.....	$2\frac{1}{2}$	$5\frac{1}{2}$	4	4	3	19	$3\frac{1}{2}$
Crandall.....	4	$4\frac{1}{2}$	$5\frac{1}{2}$	4	3	21	$4\frac{1}{2}$
Fay.....	$3\frac{1}{2}$	4	$2\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{1}{2}$	15	3
Lee.....	3	4	$2\frac{1}{2}$	3	$1\frac{1}{2}$	14	$2\frac{1}{2}$
Naples.....	3	$4\frac{1}{2}$	3	4	$3\frac{1}{2}$	18	$3\frac{1}{2}$
New Victoria.....	$4\frac{1}{2}$	5	5	5	3	$22\frac{1}{2}$	$4\frac{1}{2}$
North Star.....	$4\frac{1}{2}$	$5\frac{1}{2}$	$2\frac{1}{2}$	4	2	$18\frac{1}{2}$	$*3\frac{1}{2}$
*Perfection.....				$\frac{1}{2}$	1		
Pomona.....	$4\frac{1}{2}$	4	$3\frac{1}{2}$	4	3	$18\frac{3}{4}$	$*3\frac{1}{2}$
Prince Albert.....	4	$4\frac{1}{2}$	4	5	3	$20\frac{1}{2}$	*4
†Raby Castle.....	5	6	4	5	3	23	$4\frac{1}{2}$
Red Cross.....	4	$4\frac{1}{2}$	$3\frac{1}{2}$	2	1	$14\frac{3}{4}$	$*2\frac{1}{2}$
†Red Dutch.....	$6\frac{1}{2}$	$7\frac{1}{2}$	4	$3\frac{1}{2}$	2	$23\frac{1}{2}$	$*4\frac{1}{2}$
Red Victoria.....	6	7	5	5	3	26	$5\frac{1}{2}$
Saunders.....	3	5	4		2	18	$3\frac{1}{2}$
*Standard.....				$\frac{1}{2}$	$1\frac{1}{2}$		
*Success.....				$\frac{1}{4}$	1		
Versailles.....	3	4	3	$2\frac{1}{2}$	2	$14\frac{1}{2}$	$*2\frac{1}{2}$
White Grape.....	4	5	$2\frac{1}{2}$	3	2	$16\frac{1}{2}$	$*3\frac{1}{2}$
White Imperial.....	3	4	$1\frac{1}{2}$	$1\frac{1}{2}$	1	11	$2\frac{1}{2}$
Wilder.....	• 4	$5\frac{1}{2}$	4	5	$2\frac{1}{2}$	21	$4\frac{1}{5}$

\* Planted recently.

† Rather small, and therefore discarded, yet they give a heavy yield.

#### NOTES BY HAROLD JONES (*St. Lawrence Station*).

CHERRY, RABY CASTLE, and VICTORIA, in reds have given the best results.

FAYS is disappointing in both wood and bunch.

POMONA has not shown any special feature of merit, and is not holding its own with the three varieties mentioned above.

PRINCE ALBERT is a strong, vigorous bush, with an abundance of foliage, but the fruit is too late in ripening and is very acid.

WHITE GRAPE gives good results, and is a desirable and valuable currant.

VICTORIA (Black), is very large in fruit, but does not give as good crops as Lees Prolific.

#### NOTES BY CHAS. YOUNG (*Algoma Station*).

This is a fruit that never fails here. Our climate and soil seems perfectly adapted to it. An old experienced grower from the east, in looking

over the experimental plot this fall, made the observation that I had left more fruit on the bushes after picking than what they would consider a full crop. Be that as it may, it is a crop that never fails; plenty of stable manure, shallow cultivation, cutting out all wood over three years old, meets all the requirements. I have very little choice of varieties. In some, the individual berries are larger, but the gross yield is no better. Versailles red and Champion black are perhaps as good as any; White Grape is not saleable here. No disease or insect troubles them, but what can be easily controlled with Paris green or hellebore. After strawberries this is the best paying crop I can grow, and the supply is not nearly equal to the demand. Taking into consideration the small amount of labor required and the certainty of a crop, currants have always been satisfactory.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

Currants were a fair crop, about equal with last year, in fact, to the box. In reds, the favorites are Red Cross, Fays, Prince Albert and Cherry; in blacks, Champion and Naples; in whites, White Grape, Wilder, and other varieties which have not fruited sufficiently yet for me to say much about them. A few new varieties, such as Perfection, were planted last spring; in all, I have about eighteen varieties.

CHERRY: Bush of spreading habit, not as strong as Fays or Red Cross; fruit, large; color, red; quality, good; yield per bush., 83 oz.; ripe July 18th.

CHAMPION: Bush strong, vigorous and hardy; fruit, large; color, black; quality, best; yield, 63 oz. per bush; ripe, July 18th; one of the best.

CHAMPION: Bush, strong, vigorous and hardy; fruit, very large; color, red; quality, good; yield, 97 oz. per bush; ripe, July 18th.

NORTH STAR: Bush, rather small canes and weak, hardy; fruit, small; color, red; quality, poor; yield, 68 oz.; ripe, July 30th.

NAPLES: Bush, strong and vigorous, hardy and healthy; fruit, large, black; quality, good, yield, 66 oz.; ripe, July 18th.

POMONA: Bush, a rather poor grower, not as vigorous as it might be; fruit, medium to large; color, red; quality, best; yield, 83 oz.; ripe, July 10th.

PRINCE ALBERT: Bush, strong and vigorous, with handsome foliage, healthy and hardy; fruit large, red; quality, good; yield, 112 oz.; ripe, July 30th.

RED CROSS: Bush, a strong, vigorous grower and hardy; fruit, large; color, red; quality, best; yield, 63 oz.; ripe, July 20th.

RABY CASTLE: An old variety, but good in its place; a heavy cropper; bush, strong and vigorous, very hardy; fruit, small; color, red; quality, rather acid; a late variety; hangs on the bush well; yield, 78 oz.; ripe, July 30th.

WHITE GRAPE: Bush, strong, upright grower; fruit, medium to large; color, white; quality, good; yield, 50 oz.; ripe, July 15th; the best white Currant.

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## GOOSEBERRIES.

NOTES BY HAROLD JONES, (*St. Lawrence Station*).

DOWNING maintains its character for prolific bearing and perfect freedom from disease, but the fruit is rather small for ready sale.



GOLDEN PROLIFIC, planted 1905, gave a scattered crop of large, handsome berries, and as the bush seems free from disease it gives promise of being of value.

CHAMPION, planted 1905, gave a good crop of fruit, but the size was no better than Downing, with more small berries. However, the fruit hung in clusters in a way that made harvesting very easy and rapid, and it may prove of value on further trial.

NOTES BY CHAS. YOUNG, (*Algoma Station*).

These have always been satisfactory, and, although not as sure a crop as currants, in no year have they failed to make a satisfactory return for the attention they received. I have fourteen varieties under test. Our old berry, the Houghton, bears heavily, but is too small. Downing is better in regard to size, but no better in quality. Pearl has fewer small berries than the former, and looks on that account better in the basket, but smaller in regard to yield. The English berries, although larger, with me are not so profitable, nor do I consider the quality as a rule as good; they are mostly thick and tough in the skin, and do not make as fine a quality of preserves as the Downing or Pearl. Sometimes an individual bush will give an extraordinary crop, but they cannot be depended upon like the American varieties. The best may be Industry. Red Jacket produces well, but the bushes are small yet. I have not seen a mildewed berry for years, and I take no special precaution to prevent it. The local price keeps always the same, 10c. a box. The same cultivation as for currants is all they require. I would hesitate to put plow between the rows, or use any tool that would go deeper than a horse cultivator. I do not approve of the system of growing from a single stem; it has many disadvantages and nothing to recommend it, unless, perhaps, a little easier to get at the berries.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

The gooseberry crop was about one-third less than last year, but the quality was good. The demand for this fruit is steadily growing, prices for the last few years have been quite satisfactory; the chief varieties grown are Downing and Pearl; ten varieties are now under test; a number of the new have not fruited yet, except a very few berries not worth recording.

DOWNING: Bush, strong and vigorous, hardy; fruit, medium to large; color, green; quality, good; yield, three quarts per bush.

PEARL: Bush resembles Downing in every respect; fruit also, cannot see any difference; yield, three and two-third quarts.

CROWN BOB: WHITESMITH; yield a few berries, but of so small quantity that it was not worth noting.

RED JACKET: Bush, strong, vigorous, hardy, of spreading habit; fruit, large; color, red when ripe; quality, good; a profitable variety; yield, per bush., four quarts.

## GRAPES.

NOTES BY M. PETTIT, (*Wentworth Station*).

Another year's experience with the varieties of grapes grown at this station proves that the list for profit already given is still correct.

AGAWAM (Rog. No. 15) has been the most profitable this year. Closely following are Delaware, Catawba, and Niagara. The next for profit have been Campbell's Early, Champion, Concord, Lindley, and Worden; then Wilder, Moore's Early, and Moore's Diamond.

Wet weather, during the last of June and the first week in July, caused an unusual form of fungus; the grapes when quite small turned a pale color, dried up and dropped out, leaving the clusters thin and unshapely. Niagara and some of the Rogers suffered most. Later, the foliage, on unsprayed vines, became very weak, and a considerable quantity of it dropped off. Vineyards that were sprayed with the Bordeaux mixture before they bloomed were entirely free from this trouble; those sprayed every ten days after it appeared were in fair condition, but it was clearly shown that one spraying before blooming was of more value than three or four times after the fungus appeared. With a good port spraying outfit, one man, with one horse, will spray eight or ten acres a day, which will add in most seasons from 10 to 50 per cent. to the value of the crop.

All the varieties I have in cultivation have been fully described in previous reports, and their productiveness this year does not justify making any changes in those reports.

The first 100 baskets of Champion was gathered this year on Aug. 28th and sold at 30c. per basket.

Campbell's Early, on Sept. 3rd, sold at 35c. per basket.

Moore's Early, on Sept. 3rd, sold at 28c. per basket.

Red Rogers, on Sept. 6th, sold at 30c. per basket.

Niagara, on Sept. 11th, sold at 25c. per basket.

Worden, on Sept. 12th, sold at 20c. per basket.

Delaware, on Sept. 15th, sold at 30c. per basket.

Concord, on Sept. 19th, sold at 17c. per basket.

Agawam and Catawba were sold, on Oct. 20th, at 22c. per basket for car load.

By J. L. HILBORN, (*South-western Station*).

There are very few grapes grown here for market purposes, except on Pelee Island, and the acreage there is small since the winter of 1899 when many of the vineyards were frozen out.

Nearly all varieties of grapes do well here, and I am satisfied that grape growing, especially of the early varieties, and properly handled, would prove very remunerative.

Practically no pears, and not many apples, are grown for shipping purposes lately. Most of the apples are either canned or evaporated.

## PEACHES.

NOTES BY L. WOOLVERTON, GRIMSBY, ONT.

BEER'S SMOCK: This peach impressed me favorably as being larger and more attractive than Smock, though perhaps not quite so late in season. It ripened during the first week in October. The fruit is yellow, with red cheek; the flesh yellow, tender and juicy and of a good flavor.

CARLISLE: Quite a different peach from the one grown under that name about St. Catharines, which is a yellow flesh and ripe in September. This



is a large, white flesh peach, with greenish, white skin, not showy in appearance, but quite large in size, and hangs on the tree until the 20th of October, or even later.

**CHAMPION:** This was in season early in September, coming in with the last of the Yellow St. John. It was one of the most productive varieties in the orchard and has been ever since the trees came into bearing. The color is yellowish white, with red cheek, and the flesh whitish; the flavor is delicious. I would highly commend this peach for the home garden. I am not prepared to pass judgment upon it for market purposes, because it competes with the Yellow St. John.

**CROSBY:** Season, middle to last of September, after the Early Crawford is well out of the market. The fruit is medium in size, yellow fleshed, and firm enough to be a good shipper. The tree is vigorous and productive.

**EARLY CRAWFORD:** This old variety still holds the first place as the best all round peach grown in Ontario. The fruit buds do not seem to be quite as hardy as some other kinds, but in favorable localities the tree is quite productive. The fruit is magnificent, being very large, of beautiful golden color, with a rich crimson cheek. There are several other peaches competing with it, such as Garfield, Fitzgerald, Millionaire, New Prolific, Reeves, Wonderful, etc., but if Early Crawford were the novelty, we believe it would create a tremendous boom in the face of them all.

**ELBERTA:** This peach is coming to the front in Ontario as a leading commercial variety, and is being planted by the thousand: perhaps it is being over-planted, like many other favorites. During the past season Elberta excelled itself. The trees were vigorous and healthy, without a sign of curl leaf, to which many claimed they were subject, and they bore prodigious crops. The fruit was immense in size, notwithstanding the quantity; and there were no small ones to cull out. The shipping quality of this peach is one of its points of merit. We are hoping to be able to export it to Great Britain with success next season.

**FITZGERALD:** Of the Crawford type; excellent in quality; an excellent market peach; by some counted more profitable than Early Crawford.

**FOSTER:** Another of the Early Crawford type; of tender flesh; by some considered superior to the latter in quality, and consequently especially desirable for home uses.

**GREENSBORO:** Of about the same season as Alexander, but larger and rather more desirable for home uses. 1st picking, August 6th; fruit was rather acid, but good cut up with cream; not very attractive; too tender for distant shipments.

**HYNES:** The very nicest little peach for dessert, beautiful in color and delicious in flavor, flesh tender and juicy, semi-free; should never be omitted from the home garden, and shows up beautifully in the shipping basket.

**JACQUES RARERIPE:** A fine peach of the Early Crawford type, and nearly the same in season.

**LATE CRAWFORD:** Inferior to Early Crawford; tree not very productive; drops fruit early.

**LEWIS:** A beautiful, large, round, white fleshed peach with rich crimson well covering the skin; of the best quality for eating; tree very productive; season, about middle of August; a valuable market variety.

**LONGHURST:** A magnificent canning peach; small and unprofitable where not thinned or uncultivated; but where well grown, large and fine, and very profitable; fruit buds more hardy than some other kinds; season, last of September.

**MOUNTAIN ROSE:** A delicious dessert peach which should be in every garden; creamy white in color, tinged with red; flesh white, juicy, free.

**NEW PROLIFIC:** Of the Early Crawford type, but on my grounds rather more productive; season, early September; I believe it well worthy of a large place in the commercial orchard.

**OLD MIXON:** This old and excellent white-fleshed variety is superseded for market purposes by the numerous excellent yellow flesh varieties of the same season. It closely follows the Early Crawford in season.

**REEVES:** Of Early Crawford type, ripening middle of September; the tree is very vigorous, but lacks in productiveness.

**RIVERS:** An early variety, which was at first liberally planted in our commercial orchards, but now discarded because of its tender flesh which shows the slightest bruise. The color of skin or flesh is creamy white.

**SAINT JOHN:** A very popular market peach, closely resembling Early Crawford, but ripening a week earlier; about the earliest really valuable peach for the commercial orchard.

**SMOCK:** A splendid late market peach when the season is favorable for its ripening and coloring. This year, in many orchards, it was lacking in color; season, first week in October.

**SNEED:** This variety was very satisfactory with me this season, ripening the 22nd of June, and yielding wonderfully well; it was a poor shipper, but it had no Canadian-grown competitor. I picked the last about August 1st; the fruit is white fleshed, and very tender.

**TRIUMPH:** Where well thinned, large, fine and highly colored, with deep red and yellow ground; a good shipper; a semi-cling, and very variable; the tree is subject to twig blight, and should not be planted too freely.

**WONDERFUL:** Of Early Crawford type, but later in season; fruit large, golden yellow and very beautiful, but the tree is lacking in productiveness.

**NEW SEEDLINGS** are constantly showing up. Mr. A. Ruthérford, of Grimsby, had in his orchard four trees of a remarkably large and fine yellow fleshed peach, later than Elberta; and Mr. Beverly Book has been showing another, still larger, a free stone, of excellent quality, ripening just in advance of the Smock.

The **SMITHSON**, a fine peach of the Early Crawford type, originating near Grimsby, has been planted to a considerable extent about Grimsby.

The **WELLINGTON**, a new yellow flesh peach, also late in maturity, is being offered for sale in the Niagara district. The fruit was very favorably noted by our Fruit Committee some years ago, and if the tree is productive the variety is valuable.

These varieties should be propagated and tested for us at our new Fruit Station near Jordan, as quickly as possible.

BY J. L. HILBORN (*South-western Station*).

The very serious loss of peach trees by the February freeze in 1899, and again in February, 1904, almost totally destroyed the peach orchards in this district, and since the latter date the plantings of this fruit have been much lighter than for a few years previously.

Many growers were more or less discouraged with peach growing, and turned their attention to other crops. This is the chief cause of such an increased quantity of tobacco being grown here the last few years, one hundred and fifty cars being shipped from Leamington the past season.

The growing of early tomatoes and other vegetables has also increased to a great extent, largely due to the loss of the peach orchards.



However, quite a number began planting at once, and have continued planting each season. A noticeable increase in the yearly planting is very evident, and, as the trees grow very rapidly here, Essex County will soon be sending a lot of peaches to market unless a calamity occurs again.

What is called the peach land here is of a peculiar nature, and appears to contain a large amount of mineral deposit which has the effect of causing it to warm up to a high temperature with the summer sun, and, if properly handled, we can get excellent early crops of vegetables, etc., and a great tree growth.

This same peculiarity causes it to freeze very readily and very hard, and as it is a very dry soil and we get very little snow as a rule, the frost penetrates deeply when we get a severe winter and destroys the roots of the trees. Judging from past experience, one is compelled to consider peach growing is somewhat of a lottery unless some means can be devised to prevent the roots of the trees from being destroyed when we get a severe winter.

As previously stated, there are not many peach trees in bearing here yet. However, we had a few old trees and some young ones that were bearing the past summer, and found the different varieties to behave much the same as in our former orchards. Following are dates of ripening of the few varieties that fruited this season; I expect to have more varieties in bearing hereafter.

TRIUMPH was gathered from August 8th to August 14th. This variety does very well on young trees, but runs small and rots badly as the tree becomes older; it is therefore disappointing.

ADMIRAL DEWEY is about the same season, is somewhat larger, a better color, does not cling much to the pit; and is much more satisfactory, but it also rots quite badly in older trees.

BARNARD ripened from Sept. 1st to 7th, is excellent quality, but too small to take well in the market.

BRIGDEN ripened Sept. 6th to 13th; an excellent variety.

ENGOL MAMMOTH follows this variety very closely, and while it is not so large or showy, it is of good size and quality, and an excellent bearer, and I know of no better variety to grow.

NEW PROLIFIC was harvested Sept. 12th to 18th; also an excellent variety.

ELBERTA was gathered Sept. 14th to 20th, did not do so well this season with me as it does sometimes; I think this variety is being overplanted.

KALAMAZOO, Sept. 20th to 25th.

BANNER, Sept. 24th to Oct. 4th, another excellent variety, but is sometimes small on young trees.

GOLDEN DROP, Sept. 29th to Oct. 8th; a profitable variety if properly pruned and thinned, otherwise too small.

LEMON FREE, Oct. 2nd to 9th.

I have fruited many other varieties in former years, and consider the following among the best varieties for this section of those I have tested: Brigden, Engol Mammoth, New Prolific, Elberta, Kalamazoo, Banner, Golden Drop.

Our soil is too light for the Crawfords to do well, therefore they have been but little planted of late.

#### WINTER PROTECTION OF THE PEACH TREE.

In this immediate vicinity peach growing is attracting much more attention than all other fruits, and if some means can be devised to prevent

the roots of the trees from freezing so severely during severe winters I think peaches could be produced here as good and at as great a profit as in any locality with which I am acquainted.

COVER CROPS are an excellent help in any orchard, and I have always sown all peach orchards with something calculated for cover crop ever since I have been trying to grow peaches.

I have tried everything recommended for this purpose, but the last few years have now settled on what I now consider is best suited for my purpose.

For young orchards, until they come into bearing, I sow Yellow Aberdeen turnips broadcast and harrow in. I like to have the orchard thoroughly cultivated up to the time of sowing, 12th to 20th of July.

In a bearing orchard, I like to cultivate to about Sept. 1st, then sow to oats rather thickly.

While cover crops are all right in an orchard, no cover crop that can be grown here will save the trees through such winters as those of 1899 and 1904, for the simple reason that directly around and under the trees is where we are most in need of protection, and it is impossible to get a growth of anything under a bearing peach tree at this season in this dry soil.

After losing two as fine peach orchards as I ever saw, I resolved not to give up in despair like many others, which may prove to be the best way, but to endeavor to learn by what means I could save my trees in future should we again be visited by such conditions as we have experienced.

When pulling out my 5,000 dead trees after my first loss, and again five years later when pulling out about 3,500, I examined a large number of trees and found that many of them appeared to have the greater portion of their roots still alive but the bark at the base of the tree trunk was completely killed just above the roots and this convinced me that the sand freezing so hard as it evidently did against this rather soft bark was responsible for much of the damage, and that this point must also be protected; therefore the next fall and every fall since we have protected every peach tree on our farm.

We first remove the soil at the base of each tree, and, if any Borers are present, dig them out. Then each tree is wrapped with building paper or veneer. The last two seasons I have used veneer for nearly all. Each tree is then mulched with litter of some sort, mostly old straw, procured wherever we can get the remnant of an old strawstack. Tomato vines and clover chaff have also been used to some extent. This is left under the trees, and the next season more is added if necessary. While this would appear to be a great deal of labor, and to take a lot of material, we do not find it very expensive, or to take nearly as much material as I at first imagined it would require.

The fact of this space beneath the tree being covered with this mulch is, I think, good for the tree, and saves considerable in the cultivation of the orchard.

We are still experimenting with different methods and material for this protection, but as we have not had a severe freeze since we have been giving protection, all trees have wintered well whether protected or not.

I am not anxious for another such winter as those that destroyed our other orchards to test the value of these different methods of protection, but if such should come, I think this may save our trees. However, I intend to continue to practice this system every season until something happens to convince me otherwise. There is still room for much experimental work along this line.



As previously stated, peach growing appears to be the all interesting fruit subject at present, and it would appear to me that the most important point of all is to discover some method if possible to grow orchards that would survive our precarious winters.

As the question of varieties is a very important one, and so many new varieties are being yearly introduced, if those that are likely to prove valuable could be tested, no doubt much valuable information could be gained, and much money saved the average grower who now has to do his own testing or plant the old varieties that have been tested. I have been planting several varieties not much grown in Canada that are likely to prove valuable, and am well aware that many new varieties now being offered are likely to prove valuable, especially if some of them prove to be capable of withstanding long shipments better than some of the older and otherwise good varieties.

NOTES BY W. W. HILBORN (*South-western Station.*)

The experimental plot of peach trees planted in the spring of 1904 has made a good growth this season. The trees came through the past winter in perfect condition. The ground among them had been sown to rye the previous autumn, which made a good covering during winter, and when plowed under in the spring adds humus to the soil. In the autumn every tree was banked up with a mound of soil twelve to fifteen inches high; this was removed in early spring. Early tomatoes were planted this season among the trees. When the crop was gathered the plants were pulled up and placed around the trees, and enough coarse manure added to make a good mulch for root protection during the winter, and the ground again sown to rye.

PEACH CULTURE. The cultivation of the peach in this locality had reached large proportions previous to the freeze-out during the winter of 1899. One thousand acres devoted to this fruit could be seen from our farm. Ninety per cent. of the trees were killed by root-freezing at the above date. Considerable replanting was done, and four years later another freeze-out occurred equally as severe as the first. Since that time there have not been many large orchards planted on account of the danger from root-freezing. Those that have been planted are doing well, and quite a number of growers are resorting to some method of root protection. The only danger from root-freezing is when we have a long period of continued freezing without snow or other covering on the ground. Frost sometimes penetrates four or five feet deep in our sandy soil, or below the roots of the trees, and when this occurs it is death to them. It is hoped that winter-killing may be prevented by the above method of mulching.

In planting an orchard, I prefer No. 1 one year old trees, and planted in spring just when growth begins. Head back to 2 or 2½ feet high; subsequent pruning should be done every spring after hard freezing weather is past. Cut back the past season's growth one-quarter to one-half, and thin out the head of the tree to give sufficient circulation of air and admit plenty of sunlight. During the first two seasons some early hoed crop may be grown among the trees. In August, or as soon as the crop is harvested, sow to some cover crop such as rye, crimson clover, turnips or rape.

VARIETIES. It is of the greatest importance to make a proper selection of varieties for a commercial orchard. Our customers want peaches regularly during the whole season, and one sort lasts but a few days, hence the necessity of selecting those kinds that will not only give a succession, but will produce fruit of the best quality. Everybody wants Crawford peaches, therefore we should select as far as possible of that type. The following varieties have proved very satisfactory with me, and are named in their order

of ripening; they cover the whole season: Alexander, Greensboro (white flesh), St. John, Garfield, Early Crawford, Fitzgerald, Prolific, Engol Mammoth, Elberta, Golden Drop, Bronson, Kalamazoo, Smock, and Banner (yellow flesh).

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

All the peach trees planted before the hard winters of two years ago were killed out; the young trees planted since are doing well, but have not fruited yet. It is doubtful if ever we will have a peach that will be hardy enough to be successful here; it is no trouble to grow the trees, but the buds winter kill.

## PEARS.

NOTES BY M. PETTIT (*Wentworth Station*).

GIFFARD was one of the most profitable this season; the crop was heavy, free from scab and sold at good prices.

BARTLETTs were a very fine sample and in good demand.

FLEMISH BEAUTY, medium sample with considerable fungus.

ANJOU, a heavy crop and fine sample.

DUCHESS, a heavy crop; not so large as usual; they were shipped to Cape Town, South Africa, at a good price.

KIEFER, a full crop; not as large as usual; in good demand for canning at 1½c. per lb.

PEAR BLIGHT has been very destructive at this station and throughout this district during the summers of 1904, 1905 and 1906; the two first summers all blighted branches were cut out below any appearance of blight and taken out of the orchard. Even with this precaution, 25 Clapp's Favorite, planted 16 years, are entirely destroyed; of 100 Flemish Beauty planted over 20 years 48 were entirely destroyed, and all of the rest partially gone. Bartlett, of 170 planted about 20 years, 68 are entirely destroyed, 55 partly gone and not one left entirely free from blight. Piffard, of 520 from 12 to 20 years planted, 27 are entirely gone, about 50 slightly damaged, balance healthy. Kieffer, of 1,500 planted 13 years, 22 are entirely destroyed, about 50 slightly damaged, balance healthy. Duchess Dwarf, of 300 planted over 20 years, some were slightly damaged during the past summer.

All of the varieties mentioned have had continued cultivation.

SAN JOSE SCALE was found by the Inspector on two trees in the experimental orchard; one of them was cut down and burned, the other thoroughly sprayed with the lime and sulphur mixture, also all other trees in that orchard. A careful inspection was made by the Inspector during the summer and no scale was found.

CODLING MOTH has been much more destructive than in previous years, both in apples and pears. Swift's arsenite of lead and white arsenic were both used with Bordeaux, and showed a little in favor of the arsenite of lead.

NOTES BY HAROLD JONES (*St. Lawrence Station*).

Of the forty varieties of pears planted in 1896-97-98, only five have lived through the severe winters of 1903 and 1904. The injury was not due to root-killing, but they died down to the root. Those alive are:

BESSEMIANKA: Planted 1896; a vigorous, close, round head; hardy; fruits nearly every year, but fruit of no value, rotting at the core before maturity.



CLAPP'S FAVORITE: Planted 1896; an upright, vigorous tree; shows some injury from frost; fruit buds tender, only bearing in favorable seasons.

FLEMISH BEAUTY: Planted 1896; an upright, compact tree, hardy; bears fruit nearly every year; the most desirable to plant of all varieties yet tested.

RITSON: Planted 1896; fairly hardy, but shows injury in severe years; fruit bud tender; only a scattered crop in favorable years.

VICTORIA: A hardy iron-clad of Russian origin, but fruit of no value.

NOTES BY J. G. MITCHELL, (*Georgian Bay Station*).

We again have had a fine crop of pears. Such varieties as Anjou, Bartlett, Seckel, Duchess, Howell, Clapp's Favorite, Beurre Clairgeau Bartlett, Seckel, and Flemish Beauty, carried fine crops, all that could be desired. These are the well tried varieties, and succeed as well as apples.

We have quite a large number of varieties which have not fruited yet. Among these there is an importation direct from France. Some of them are very promising, while others are doing rather poorly. However, enough has been done along this line to show that pears of the best quality and also of the best varieties are grown quite as successfully in this district as any other fruit.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

The young pear trees are doing very well now, but quite a number were lost by the frost two years ago, and had to be replaced or grafted over; a few trees were lost this season by the blight; very few have fruited as yet, none worth reporting on; quite a number of Kieffer trees has been planted for top grafting. Those that have been grafted are making a vigorous growth, and I believe will make satisfactory orchard trees.

NOTES BY G. C. CASTON (*Simcoe Station*).

I have been top working a number of pears on Flemish Beauty and Russian stock, with a fair measure of success. Although the winter of 1903-4 was very hard on them, Bartlett has done the best so far, top worked on hardy stock. But I have in the orchard a block of trees of Clapp's Favorite, that are quite healthy and thrifty, and are just beginning to bear.

FLEMISH BEAUTY is quite hardy here, and is a long lived tree; but most years it is entirely worthless for fungus scab, as few people take the trouble to spray sufficiently to keep the fruit clean.

NOTES BY CHAS. YOUNG, (*Algoma Station*).

Up until the winter of 1903-4 this fruit did fairly well, that is, one might grow a few for home use; but for commercial purposes they have been, and I am satisfied will be, a failure unless we can get something different from what we have. As it is, there have been no pears here this year except some Russians, which we would be better without. With the exception of Kieffer, none were entirely killed in the spring of 1904; the roots and part of the trunk were alive and sent out strong, sappy shoots which in most cases were again frozen the following winter. Anjou is not considered very hardy, but it has stood the winter better than most of the others; Idaho perhaps next, followed by Flemish Beauty and Goodale. Out of twenty planted in 1900, only five remain with the original top, and they are not promising.

## PLUMS.

NOTES BY W. T. MACOUN, OTTAWA, ON HARDY PLUMS.

Each year's experience strengthens our conviction that for Eastern Ontario and for all Ontario north of latitude 45°, and in some places south of that, the main dependence for the present must be on the Americana and Nigra plums. As seedlings of the Domestica or European plums, are raised and fruited at their northern limit, there will, we feel sure, eventually be produced varieties of this class of plum which will extend its culture northward, but at present we have no plums of this class that can be grown in the northern parts of Ontario that will prove profitable if grown commercially. The seedling European plums originated on the Island of Montreal appear decidedly hardier than most of the named sorts. As these have not been described, as far as we know, in the reports of the Ontario Fruit Experiment Stations, the following descriptions are given of the four most promising varieties, namely, the Mount Royal, Raynes, Lunn, and Mountain:

**MOUNT ROYAL** (Dunlop 54): Fruit received from W. W. Dunlop, Outremont, Que. Fruit roundish, flattened at stem end; size medium; cavity medium to open, medium depth, somewhat flaring; stem short to medium, moderately stout; suture distinct, very slightly depressed; apex rounded, slightly flattened; colour dark purple; dots numerous, irregular, distinct; bloom blue, moderate; skin moderately thick, moderately tender; flesh greenish yellow, juicy, firm; stone below medium, roundish cling; flavour sweet, moderately rich; quality good; season early to mid September. Should be a good shipping plum.

**RAYNES** (Dunlop 53): Fruit received from W. W. Dunlop, Outremont, Que. Form oval, long, flattened on side of suture; size above medium to large; cavity medium depth and width, abrupt; stem medium length, moderately stout; suture distinct, slightly depressed; apex rounded; colour dark reddish purple; dots small, numerous, indistinct; bloom moderate, blue; skin thin, tender; flesh, yellowish green, firm, fairly juicy; stone above medium to large, long, oval, free; moderately sweet; quality above medium; season early to middle of September. A prolific bearer and should be a good shipper. A prune plum.

**LUNN** (Montreal, No 60): Fruit received from W. W. Dunlop, Outremont, Que. Form oval, broad (round oval); size large; cavity shallow, medium width, slightly flaring; stem medium length,  $\frac{1}{2}$  inch stout; suture a distinct line, very little if any depression; apex rounded, very slightly flattened; colour dark purple; dots fairly numerous, irregular, indistinct, brownish; bloom moderate; blue; skin, moderately thick, tough; flesh yellowish green, very juicy, fairly firm; stone large, oval, cling; sweet, rich; quality very good. Season early to middle of September. A fine dessert plum.

**MOUNTAIN**: Fruit received from W. W. Dunlop, Outremont, Que. Form roundish, flattened slightly at ends; size medium to above; cavity medium depth and width, slightly flaring; stem medium to long, moderately stout, suture distinct, usually slightly depressed; apex slightly flattened, colour, greenish yellow, more or less overspread with dull coppery red; dots numerous, yellow, distinct; bloom thin, bluish; skin moderately thick, tough; flesh yellowish green; stone above medium, broad, roundish, cling; sweet,



rich; quality very good; season early to middle September. An excellent dessert plum. Well worth propagation.

The variety known as Lachine is also a profitable kind to grow. It resembles the Yellow Egg somewhat. These varieties are not yet offered for sale by nurserymen, but they should be propagated as soon as possible, as they are valuable.

In addition to these Montreal seedlings, the hardiest kinds at Ottawa have been the Richland, Early Red Russian and Ungarish, which kinds have at times produced good crops. The Glass seedling is as hardy and healthy a tree as any European plum that has been tested, if not more so, but it has proved tender in the fruit bud, more so than the Early Red, which is not as vigorous a tree. The Perdrigon is a red European plum, introduced from France by the Trappist Fathers at Oka, Que., which has proved hardier than most kinds there. This has not fruited yet at Ottawa, but we have tested the fruit and find it of very good quality. The following description was made of it:

**PERDRIGON:** Form oval, flattened on one side; size large; cavity narrow, medium depth, abrupt; stem short to medium, stout; suture a distinct line, no depression; apex rounded; colour deep yellow, more or less overspread with red; dots numerous, distinct; bloom, moderate, pinkish; skin moderately thick, moderately tender; flesh yellow, moderately firm, juicy; stone large, oval, rough, free; flavor sweet and rich. Quality very good. Season early to mid September. A handsome dessert plum.

The following descriptions are given of the Early Red, Richland, and Ungarish:

**EARLY RED:** Form oval; medium size; cavity narrow, shallow, abrupt; stem medium length, slender; suture an indistinct line, no depression; apex rounded; colour dull purplish red; dots moderately numerous, yellow, distinct; bloom thin, blue; skin fairly thick, moderately tender; flesh yellowish green, juicy; stone medium size, long, oval, cling; moderately sweet with an acid aftertaste; quality medium. Season, late September. Of the Lombard type. Imported from Russia by Prof. Budd from Dr. Regel, St. Petersburg, during the winter of 1881-2. Prof Budd writing in 1890 said of this plum, 'This was sent out quite extensively eight years ago marked 'mixed Arab.' The sorts mixed were Early Red, White Nicholas and Black Arab,' most of the trees proved to be Early Red Russian No. 3.

**RICHLAND:** Form oval; size medium to above; cavity narrow, medium depth, abrupt; stem medium length,  $\frac{3}{4}$ -inch, slender; suture a distinct line, no depression; apex rounded; colour deep purplish red; dots fairly numerous, yellow, indistinct; bloom moderate, blue; skin thick, fairly tender; flesh greenish yellow, juicy, moderately firm; stone medium size, oval, flat, cling; sweet but not rich; quality above medium. Season, middle of September. Hardier than most European sorts. Originated on the farm of Randall Elden, Richland, Pennsylvania.

**UNGARISH:** Form long, oval; size above medium to large; cavity narrow, shallow, abrupt; suture distinct, very slightly if at all depressed; apex round; colour dark purple; dots moderately numerous, indistinct, brown; bloom moderate, blue; skin fairly thick, tender; flesh greenish yellow, firm, fairly juicy; stone large, long, oval, free; moderately sweet; quality above medium; season, middle of September. Introduced by Prof. Budd from C. H. Wagner, Riga, Russia.

This plum is somewhat like the Raynes (Dunlops, 53). A prune plum. promising on account of hardiness.

None of the Japanese plums have proved hardy at Ottawa, although there have been a few specimens of Red June. Seeds of these were sowed, and from these have been produced the Togo and Oyama, two seedlings which evidently have Americana blood, although they resemble the Japanese in most particulars. Both of these varieties are hardier in fruit bud than any of the Japanese yet tested and both of them are quite promising. Quite a number of hybrid varieties with Japanese and Americana blood procured from the United States are being tested, but none of these have fruited. Good crops of Americana and Nigra plums are obtained every year at Ottawa, and some of the best varieties are not to be despised. Canadian nurserymen seem slow to propagate the earlier varieties, those usually advertised being among the latest. A good selection to cover the season is Odegard, Aitkin, Bixby, Mankato, Cheney, Wolf, Hawkeye, Stoddard, Bouncer, Admiral Schley, and Aren, and two very good varieties of more recent introduction. Cottrell is one of the best for eating out of hand.

A number of seedlings originated at the Central Experimental Farm have been named as they are considered very promising. These are Bouncer, Don, Caro, Consul, Sunrise, Welcome, Kilmore, Swift, Gloria, Fitzroy. Seedlings of these are being grown, some of which should fruit next year. What is aimed at is to obtain a large plum, with a thick skin, without astringency and having a freestone. The flavor of many kinds is very good. Nearly all these points have been obtained among sound varieties, and what is desired is to unite them in one.

NOTES BY J. L. HILBORN, (*South-Western Station*).

Plums are but little grown here, and this season were almost an entire failure, except in our own orchard. We have about 200 trees of Burbank which produced a good crop of excellent quality which sold readily.

Two thorough sprayings were given with Bordeaux mixture, which we thought did much towards the success of this crop.

NOTES BY M. PETTIT, (*Wentworth Station*).

The plum crop at this station was an entire failure. The buds of the Japan varieties were destroyed by winter killing, having started during the warm weather in January. Other kinds were destroyed by spraying with soda Bordeaux; that is, sal soda in place of lime in Bordeaux mixture. This was used during the spring of 1905, and killed this season's fruit buds.

NOTES BY J. G. MITCHELL, (*Georgian Bay Station*).

I regret to say that there is nothing new to add to last report on plums. There were no plums on the Station grounds or in the district to amount to anything, and just why they failed it would be very hard to say.

There was a magnificent crop of cherries, and all bloom about the same time.

Peaches were also a failure, only a few stray fruits to be found.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

The crop, as stated in general notes, was a total failure, some trees being killed straight by having the buds frozen; others sent out but a very small crop of foliage. It is doubtful if some of them come through the



winter alive. The Japan varieties seem to suffer the most in having the buds frozen. This is owing, no doubt, to the habit of starting growth so early in the spring, but still, in my opinion, they have a place in the commercial orchard.

NOTES BY G. C. CASTON, (*Simcoe Station*).

The Japan plums are practically all gone, a few trees of Burbank, half dead, are all that are left.

Of about forty varieties of the European class tested only one, the STAUNTON, has proved hardy here. This plum is quite healthy yet and is getting to be quite a large tree. It is a large purple or bluish plum of good quality, not very prolific, and the season is very late. My opinion, based on several years' experience with a large number of varieties, is that cherries and plums cannot be grown profitably except near large bodies of water. In fact, not far outside of the peach belt. I have a few plums of the Americana class growing yet, but they are poor stuff.

NOTES BY HAROLD JONES, (*St. Lawrence Station*).

The only plum to fruit in this section this year was Hammer. Even the wild types in the fence corners failed completely.

Of the European varieties that remain healthy in wood are Geuii, Glass Seedling, Nos. 54 and 53 Dunlop's Seedlings.

In Japans, Maru and Ogon continue healthy in wood, but do not bear. Red June and Burbank are injured, but alive and bore a little fruit in 1905.

The plums of Americans planted here, such as Cheney, Wolf, and Wyant, are not true to name and are being discarded.

NOTES BY CHAS. YOUNG, (*Algoma Fruit Station*).

Four years ago if the question was asked, what are the best varieties of plums to plant in the north? I would, without hesitation, have answered: "Plant Japans"; and in making out a list I would have started out with Red June, Burbank, Abundance, etc. But if the same question were asked today, I would first consider the individual;—what are his facilities for growing them? Would he be likely to give them sufficient care, attend to the cultivation, and give them what little pruning they require, etc? Or would he be most likely to stick them in the ground and, without any further care, go back in two or three years looking for fruit? To the latter I would say, plant Americanas and make out a list to cover the season, the best of them are late in coming to maturity, say the beginning of October; and to the former, instead of replying, "Plant Japans," I would mix up the list something as follows: Red June, Burbank, Lombard, Glass Seedling, Arctic, Green Gage, etc., not omitting a few of the Americans to fill in a season like the present, when we have no other. I see by the reports that they are scarce all over the country; they are more than scarce here, for we have none at all. Of course, this is an exceptional year, but a good all round crop of the better varieties is not to be depended on any year, with the exception of Lombard in alternate years.

## RASPBERRIES.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

The raspberry crop was much less than last year—about one-third. This was largely owing to the mild weather in January, followed by the severe frost; the summer also being very dry, the crop was materially lessened. A number of varieties have died out or have been discarded as worthless. The only varieties worthy of cultivation among the reds, are Marlboro', Herbert, and Cuthbert, ripening in order as given, but Herbert is by far the best yielder. In blacks, Conrath and Hilborn are the two best varieties; the purple varieties are not wanted in the markets, or the white either.

CUTHBERT: Plant, strong and vigorous, fairly hardy; fruit large, color dark red, quality best; yield, 216 oz. per 20 feet of row; ripe, July 20th.

HERBERT: Plant, strong, vigorous and very hardy; fruit very large, larger than Cuthbert; yield, 592 oz.; ripe, July 13th; this variety is by far the heaviest cropper of all raspberries.

MARLBORO': Plant, dwarfish in growth, hardy and healthy; fruit large, color red, quality very good; a good shipper, but rather dry for table use; yield, 272 ozs.; ripe, July 11th.

PHOENIX: Plant fairly vigorous, hardy and healthy; fruit medium to large, color red, quality good; yield, 170 ozs.; ripe, July 16th; will have to be discarded.

TURNER: Plant hardy, but lacks vigor; fruit small, soft, color dark red, quality good; yield, 223 ozs.; ripe, July 11th; will have to be discarded.

The three best varieties for commercial purposes are given in order of ripening, Marlboro, Herbert, Cuthbert; and for yield, Herbert, Cuthbert, Marlboro; for quality, Cuthbert, Herbert Marlboro'.

NOTES BY CHAS. YOUNG, (*Algoma Station*).

I may dismiss the varieties known as Black Caps, or those which root from the tips, by saying that I have tried them and found them wanting. The objectionable features are, they are more tender than others as a rule; the weight of snow breaks them down; mice have a fondness for girdling the canes in winter; they do not sell well, and I have never raised a paying crop. I have still a few that I grow for comparison but do not advise any one to plant them here.

Of those propagated by suckers, I have only four varieties: MARLBORO': large and early, but not as profitable as the others. CUTHBERT: perhaps further south would be the most profitable, but here the tendency to keep growing into winter is against it, the tops are more or less injured every spring. This latter variety, unlike the former, makes too many suckers, which require cutting out several times during the summer. I have tried laying them down and covering with earth, but with no satisfactory results, and seldom get as good a crop as I do of the Loudon, which is not as fine in quality, being somewhat crumbly. My very best raspberry for quality is BRINKLE'S ORANGE. I do not lay them down in winter; the tops of the canes will be frozen back a few inches, but this berry has a tendency to throw out strong side shoots in the spring and requires much more room and fewer plants in a hill than any of the others to give the best results. It is also more liable to disease than any of the others, but for one's own use I would strongly recommend this variety. LOUDON, I would recommend for profit



alone. I think it is better not to pinch back the tops of the canes in summer, but let them grow until spring. It is profitable to grow them here even where there are plenty of wild ones going to waste. I did not get a full crop this year; dry weather set in just when they began to ripen, and materially reduced the yield.

NOTES BY G. C. CASTON, (*Simcoe Station*).

The raspberries suffered from the same causes as the blackberries, and bore no fruit this year. We need something more hardy than Cuthbert to insure a crop every year. Looking over the lists of varieties tested elsewhere, I think the Herbert would probably fill the bill. This variety should have been tested at all the stations. I have applied for it three years in succession, but never got it. However, I have ordered a supply of plants for the spring on my own account, and will be able in a year or two to know whether it will be a success here or not.

LOUDEN is a good berry, a little hardier than Cuthbert, but does not sucker freely and is slow to propagate. The same may be said of the Miller.

MARLBORO's only qualification with me is its earliness—fits in nicely between the strawberries and the Cuthbert and other varieties.

I received a new variety this year called the Eaton, some of the plants of which bore a few specimens of fruit, and the berry is certainly a fine one. It will take a year or two to test it as to hardiness, but if it proves sufficiently hardy, it will certainly be an acquisition to the list.

## STRAWBERRIES.

NOTES BY PROF. H. L. HUTT, O.A.C., GUELPH.

The Ontario Agricultural College furnishes the following descriptive notes on a few of the leading varieties which have been tested at Guelph in comparison with over 400 other new and old varieties:—

BUSTER (Imperfect): The plant is very vigorous, with very long leaf stalk and large dark foliage. It is almost free from rust and propagates very readily. The fruit ripens rather late, is very large, only medium firm, and a salmon pink color, the seeds are deeply pitted. The quality is only fair and in flavor is slightly acid. This may make a good local market berry but is rather too soft for shipment. Compared with Clyde it is quite as large, somewhat firmer and a little darker in color.

FOUNTAIN (Perfect): A vigorous vine with large dark foliage, forming plenty of runners with strong fruiting crowns. This fruit is large, slightly conical in shape, somewhat inclined to be rough, very firm and a beautiful crimson color, seeds bright yellow. The flavor is mild sub-acid and the quality good. As a commercial berry it should rank favorably with Williams or Ruby.

HERO (Perfect): A vigorous plant with large light green leaves, makes runners freely and forms strong fruiting crowns. It is quite productive, the fruit ripens about midsummer, is of medium size, somewhat oblate in shape, medium to firm and a light crimson color. The quality is good, and the flavor pleasant. In trial shipments to Winnipeg by express, Hero arrived in better condition than any other in the consignment. As a commercial berry it is worthy of trial.

**PARSON'S BEAUTY (Perfect):** One of the most vigorous plants in the plot; the leaf stalk is stout and of medium length with a broad, dark leaf. A free plant maker and the fruiting crowns are very strong. It is very productive, the fruit ripens from mid season to late, is about the shape of Williams but has none of the objectionable green tip. The flesh is firm and the color dark crimson, seed yellow and few except at the tip. The quality is good and the flavor a pleasant sub-acid. As a late home use and market berry, Parson's deserves a place in any collection.

**RUBY (Perfect):** A good plant maker, the vines being stout and dark, very similar to Parson's Beauty. It makes runners freely and occasionally needs thinning to prevent the plants from becoming too thick. The fruit is large, firm, regular in shape, somewhat resembling Williams, but dark in color, the quality is good, flavor mildly sub-acid. This variety has done exceptionally well at Guelph, and is favorably reported upon from other sections.

**SPLENDID (Perfect):** A moderately vigorous vine with light green foliage, somewhat darker than most early varieties. It is a good plant maker and the fruiting crowns are strong. The fruit ripens among the earliest, is of medium size, very firm and a dark crimson color. The quality is good to best, and the flavor mild sub-acid to sweet. As a home use, early berry, it is hard to beat, and it is rapidly gaining favor as an early market variety.

**SUCCESS (Perfect):** The vine is fairly vigorous, making sufficient plants for a full row, but without any danger of overcrowding. The fruit ripens about mid-season, is conical in shape, of medium size, quite firm and a deep crimson color. It has a good appearance in the box, and from its record here for three years seems worthy of a place among the promising new varieties.

**WARFIELD (Imperfect):** The greatest plant maker in the plot, the leaf stalks are long and slender, leaves only medium in size. The crowns are strong and produce good fruit clusters. The roots are rather small and on dry soils or in a dry season it sometimes suffers from drought. Under favorable conditions, it is one of the heaviest croppers we have. The fruit ripens from early to mid-season, is slightly conical, medium size, very firm, and beautifully dark crimson color, seeds few and yellow, quality best, flavor acid. Highly esteemed for canning purposes.

#### NOTES BY E. B. STEVENSON, (*Strawberry Station*).

The season of 1906 was an ideal one in most respects, at least during the fruiting time, although not perhaps so favorable earlier in the season; but, on the whole one of the most favorable we have had for many years. During April the frost was very slow in coming out of the ground; we had very hard frosts on the 21st, 22nd and 23rd; not much rain before May. May came in with cold nights and frost; but much rain the first week; cold rain on the 8th and 9th, with snow flurries and heavy frost on the 10th and 11th. It turned warm on the 13th, with a warm rain up to 16th, when it became very warm, making great growth; but we had frosts on the nights of 19th and 20th, hurting the early bloom, with thunder storms on the 24th and 26th. We had some more frost on 28th and 29th, when the strawberries were well out in bloom. Mrs. Fisher's first blossoms out; also Peerless, which is a very shy bloomer; North Shore is a late bloomer. THREE W's is very full of bloom; also Howard's 3, which resembles the old Wilson.



*June 8th*: First ripe of Haverland and Clyde growing on a southern slope; on lighter soil, on the 11th picked first Irene and Tennessee Prolific on same soil.

*June 13th*: Van Deman, 1st picking on heavier soil, also Michel, August Luther, Oom Paul, Ernie, and Lord Sheffield.

*June 14th*: Early Beauty ripening, also Wild Wonder and Splendid.

*June 15th*: Good picking of Early Beauty, Oom Paul, Michel, Van Deman, Heflin's Early, Ernie, and Howard's 2; and 1st picking of Beder Wood and Warfield, and on the south slope and lighter soil a grand picking of Tennessee Prolific, Splendid, Parson's Beauty, Sample, Clyde and Haverland, which sold at 15c. per box in Guelph.

*June 17th*: First picking of E. Hathaway, Greenville, Wilson, 20th Century, Alice Hathaway, Senator Dunlop, and Johnston's Early; also Excelsior.

*June 21st*: We have had a week of rain; fog, with great heat; rust has developed on some varieties, viz., Howard's No. 2, North Shore, President Roosevelt, Wild Wonder; some on Seaford and Williams; picked Catharine and Lyon for the first.

*June 22*: Continued rain; berries growing large and fine; sold all I had at 10c. by the crate.

*June 23*: Picking most of the varieties to-day, except Abingdon, Cardinal, Mrs. Fisher, Peerless, Howard's 7, New Home, Elma, and North Shore; North Shore rusting very badly.

*June 25th*: A grand picking to-day; best berries I ever saw; very choice; sold best for 13 cents per box: the rest for 12½ cents. Howard's No. 3 and Three W's are both very heavy bearers, also Bismarck, very productive. Of the Three W's, I picked three boxes without moving; an immense crop.

*June 27th*: Picked Abingdon, Cardinal, North Shore, Ben Davis, Wonder, Commonwealth, Uncle Sam, Boston Prize, Minuteman.

*June 29*: Good picking Uncle Sam, Minuteman, Nimrod, and Victor.

*July 2nd*: Michel and E. Hathaway, Early Beauty and Ernie; Heflin's E. about over. 1st picking of Elma to-day, and also latest. The best to-day were: Three W's. Howard's 103, Annie Hubach, Auto, Lyon, Mead, Kitty Rice, Nellie Hubach, Wonder. President was grand, Minuteman, Howard's No. 7, Seaford, Woolverton, Saunders, Challenge and Beaver; a good picking of Almo; a fine picking of Cardinal, strong fruit stem, holding the berries up, easy to pick. Best sold for 15c. per box; the bulk of the picking sold for 10c. per box.

Three W's yielded to-day a box for every 2 feet of row. The best of the berries went 27 berries to the box—three layers of nine to each layer; 3 rows of 3 in a row; New Home, late, resembles Gandy; good picking of Aroma.

*July 6th*: Picked Howard's 96 and Howard's No. 2.

*July 9th*: Had a fine picking to-day of the following: President, Senator Dunlop, Woolverton, Abingdon, Haverland, Cardinal, Irene, Lyon, Auto, Minuteman, Boston Prize (too soft), Mrs. Fisher, Prof. Fisher, Uncle Sam, Bismarck, Elma, Latest, Aroma, Brandywine, North Shore, New Home, Gandy, Gen. de Wet, Peerless, Glen Mary, Commonwealth.

*July 13th*: Picked Abingdon, Cardinal, Mead, Latest, Irene, Three W's, Woolverton, Aroma, Klondike, Mrs. Fisher, Elma, Prof. Fisher.

This has been a year of very large berries and good prices. The rains, and warm, sunny weather following was just what the strawberries required to bring them to perfection; showing how much water strawberries require to produce their best. This was a season when we might say we had irriga-

tion, for we had all the water we needed, and had it just when wanted; we can also say this was a season when the wide, matted row showed up well, from which we picked almost as fine berries as from the narrow row. The wide row, having all the water needed, produced a great crop. Some varieties are especially responsive to conditions, the Sample and Dunlop especially so. On narrow rows and on lighter soil they ripen almost as early as Success; while on heavier soil and in wide matted rows, their season is almost as late as Gandy. For a juicy berry for the market, Kitty Rice, Minuteman, or President seem to be about perfect, being good growers, good yielders, perfect in form, regular, good color with a shine to them, firm and fair quality; they also look fine when in the crate. Among the best late varieties I may mention the Commonwealth. It ripens about with Gandy, is as large and fine as any and is very firm. Cardinal was at its best and is without doubt one of the best late sorts. The plant is all that could be desired except its pistillate blossom; the fruit stalk is large and strong, holding fruit up well; berry, large, glossy, easy to pick.

It is a good plan to test new varieties in the different ways, viz., hill, narrow and matted row, to discover to which way they seem best adapted. A few plants could be thus treated in each style so that comparison could easily be made. Many growers who have never tried the hill or narrow row system would be amazed to see the capacity of a strong, vigorous plant, whose runners have all been kept off; the size of the plant would surprise them, and the masses of fruit the plant would surround itself with would be a perfect revelation in fruit raising. There are not many, but those that have tried are aware of the productiveness of the strawberry when conditions are perfect.

The grower, who loves this plant, will note with great interest the various characteristics of the new kinds as they come out. It is wonderful how much each variety shows of a distinct individuality. There is an almost endless diversity in color of leaf, size of plant, growth; in length and size of runners, and in vigor; in shape and size of leaves. There is the plant that is small and hugs the ground, and the big, strong, rank grower, 14 inches high. There is the round, compact plant with close, dense growth of leaves; there is the flat, spreading, straggling plant with few leaves. Here is a plant most prolific in runners, and another one with very few. Here is the plant with runners making a plant every 12 or 14 inches from the parent, and there a plant with runners making new plants every 3 or 4 inches. Here are plants with runners like thin, wiry cords, and there are others with runners thick and fat like a lead pencil; here is a plant with a long, narrow leaf, and another with round, blunt-shape. Here is one thin and delicate of texture, and there is another thick and leathery. Here is a variety with a very dark green color having almost a black tinge; there is the light green, and another almost yellow; and so on in almost endless variety. The grower who loves his work will note all these points of differences and so come to know them.

My plots were treated as follows: The land had, for two previous seasons, roots on it; a good coating of stable manure, well rotted, was given, and it was then well ploughed and worked. After this, and just before planting, a light sowing of bone meal was given; then the plants were put into the ground, and kept free from weeds by frequent cultivation. In fall, after growth had stopped, a coating of coarse manure was put on. This mulch in the spring was raked into the rows between the plants. I did not give any spring cultivation. My trial plots yielded at the rate of 8,125 boxes per acre. I sold them, the best for 15c., some for 12½c., the balance none for less than 10c.



The old standards held a good place this season, and any variety that did not do fairly well the past season should be discarded at once, as not worth growing for any purpose. Among the best of the old sorts I might mention Haverland, Splendid, Tennessee Prolific, Sample, Williams, Brandywine, Glen Mary, Senator Dunlop, Warfield, Ruby, and Parson's Beauty. Among the newer varieties that stood in the front row this year are: Abingdon, Annie Hubach, Auto, Ben Davis, Commonwealth, Cardinal, Early Hathaway, Early Beauty, Kitty Rice, Latest, Minuteman, Mrs. Fish, Ernie, Heflin's Early, President, "Three W's," Uncle Sam, Victor, Wonder, Howard's No. 3. I will now endeavor to give a description of the different varieties in my trial plots and their worth to the public, in alphabetical order:

**ANNIE HUBACH (Perfect):** Sent out from Arkansas by H. & H.; good plant, strong and healthy, light green color, good runner, quite productive; berry large, bright scarlet, yellow seeds, berry hollow, pink flesh, fair quality; medium early.

**ABINGDON (Perfect):** Sent me by L. Blanchard, Mass.; a choice seedling; plant large, strong, healthy, yellow green, quite productive; berry large, roundish conical, crimson with red seeds, some of the pistillate berries cockscomb; flesh whitish pink, good quality, late, worth a trial.

**ARKANSAS BLACK (Perfect):** I will discard this.

**ALICE HATHAWAY (Perfect):** From Arkansas; healthy plant, good runner, productive; berry medium to small, scarlet, good quality.

**ALMO (Imperfect):** Sent me by Slaymaker & Son, of Delaware; chance seedling, found by Jas. Bane, of Judsonia, Ark.; plant strong, healthy and good size; good runner, berry about size of old Wilson; it is a dark red in color; the plant is quite productive, well worth a trial.

**AUTO (Perfect):** Sent out from Maryland; fine strong plant, healthy, good grower, quite productive; berry very large, dark scarlet, yellow seeds, roundish; flesh red and white streaked, medium in firmness, good flavor and quality; a fine one; one of the best this year. ...

**AUGUST LUTHER (Perfect):** Is early; plant small, does well on some soils; berry medium in size.

**ARMSTRONG (Perfect):** This variety, some say, is the same as New York, Corsican, Maximus, and Uncle Jim. The plant is large, strong and healthy, a good grower; medium in productiveness; berry is large to very large and good flavor.

**AROMA (Perfect):** One of the best late kinds; plant strong and healthy; the berry is large, round and fine; ripens about with Gandy and later.

**BEN DAVIS (Perfect):** Plant strong, good grower and healthy, productive; berry large, roundish conical, blunt at end, scarlet with yellow seeds, solid; flesh firm, pink, good quality and fine flavor; a good one, nice to eat out of hand.

**BEAVER (Perfect):** Sent me by M. Crawford, of Ohio; did better this year than ever before; plant hugs the ground, good grower, medium in productiveness; berry roundish conical, bright crimson, red seeds, the berry shines as if varnished; flesh pink, hollow, good spicy flavor and fine quality; a good dessert berry.

**BOSTON PRIZE (Imperfect):** Sent from North Carolina; plant good grower, healthy and productive; berry large, conical, pale scarlet pink, yellow seeds and soft fair quality; not very desirable.

**BUSTER (Imperfect):** Sent me some years ago by C. C. Stone. The plant is strong, healthy, quite productive, good grower; foliage dark green color;

the berry is large, roundish, bright red, medium in firmness, acid; medium to late season.

BISMARCK (Perfect): One of the best.

BRANDYWINE (Perfect): One of the best.

BUBACH (Imperfect): One of the best old sorts.

BEDER WOOD (Perfect): One of the best.

The above varieties have been so often described, they are so well known, they need no further description than to say they did well the past season, especially Bismarck.

CATHARINE (Imperfect): Sent me from Delaware, originated by J. F. Cannon. The plant is large, with thick, broad foliage, quite productive, good runner, makes plants freely; berry is large, roundish conical; red to the centre, colors all over; only need in firmness; good for near market.

COMMANDER (Perfect): Plant large, strong and healthy; only a few plants left to fruit, white grub injured it; will give report after another year's growing.

CLYDE (Perfect): One of the best known; very productive; did well, but does not make plants as freely, nor is the foliage as abundant as formerly; berry large, scarlet, good quality.

COMMONWEALTH (Perfect): Sent me from Massachusetts; originated by W. H. Munroe. Plant large, strong and healthy, productive; berry conical, large, dark crimson, seeds red, flesh red all through, mild flavor, firm; a good late.

CARDINAL (Imperfect): Sent me by the originator, Mr. Streator, of Ohio. The plant is strong, large and healthy, not a trace of rust, quite productive; fruit stalks are strong and hold the fruit well up, making it easy to pick; the berry is medium to large, and good color, looks well, firm and good quality; a valuable addition to our list; well worth a trial by commercial growers.

CORSICAN (Perfect): See "Armstrong."

CLIMAX (Perfect): Seedling from Bubach, by Mr. Graham, of Maryland; plant healthy, quite productive; berry large, roundish, scarlet, early.

CHALLENGE (Perfect): This is the first year the Challenge has amounted to anything with me; it had some very fine berries on this year, of best quality; not profitable.

DUNCAN (Perfect): An utter failure with me. I did not get a single berry from this variety; it is reported as doing well in other places.

EARLY HATHAWAY (Perfect): Sent me from Missouri; the plant is healthy, good runner; berry is roundish conical, flesh red all through, acid, fair quality, medium to large; scarlet, with yellow seeds; a good medium early; worth a trial.

ERNIE (Perfect): Plant healthy, a good grower, quite productive; berry ripens early, red with yellow seeds, round, large; a good medium early, good quality; well worth a trial.

EARLY MARKET (Perfect): From Arkansas; plant good runner, healthy, medium productive; berry scarlet, round and medium in size.

EARLY BEAUTY (Perfect): A good plant maker; quite productive; a good early berry; roundish; red; flesh red, acid, but good quality; worth a trial; a good one.

ELMA (Imperfect): A seedling from crossing Nettie and Roblin, fertilized by Joe; sent me by Jos. H. Black, of New Jersey; plant strong and healthy, good grower, productive; berry large to very large, round in shape, bright red, medium in firmness; flesh pink, nice spicy flavor and good quality; very late; first picking July 1st, last picking July 15th.



**EMPEROR and EMPRESS (Perfect):** By the late J. Little; resemble each other very much; same origin; plant strong, healthy, good grower, medium in productiveness; berry large and good quality; resembles the old *Jessie* very much.

**FAIRFIELD (Perfect):** Good plant maker; berry large, red, firm, and fair quality; it is an early; worth a trial.

**FLORETTA (Perfect):** Seedling of Bubach by Dr. Brown; plant good grower and healthy, fairly productive; berry large, somewhat irregular, a good early.

**GEN. DE WET (Imperfect):** Seedling of Bubach and Parker Earle, from N. J.; plant strong, healthy, a good grower, medium in productiveness; berry large and fine, somewhat soft, good color.

**GREAT WASHINGTON (Perfect):** Plant good grower, some rust, free runner and productive; the berry is large, conical, scarlet, quite firm, good flavor.

**GANDY (Perfect):** One of the last if not best late; so well known needs no further description

**GLEN MARY (Perfect):** One of the standards; plant strong, large and healthy, well known, did very well this season, hard to beat.

**GRANVILLE (Perfect):** Plant large, strong and healthy, a good grower, supposed to be from Minner's Prolific; berry is large, oblong, dark shining red, wasted; flesh solid and white inside, fine flavor; season medium to late.

**GREENVILLE (Imperfect):** Plant good grower, dark green like Bubach; quite productive; berry large, good color, resembles the old Bubach; medium in firmness; a good one for a near market.

**HOWARD (Perfect):** By J. H. Black, of New Jersey, from seed of Burton's Eclipse, crossed with Gandy; the plant is strong, healthy, dark foliage; very large, dark red and firm, season late, a good one.

**HOWARD'S No. 2 (Imperfect):** Originated by the late G. W. Howard, of Michigan; plant healthy, good runner, small, with some rust, but quite productive; berry medium to large, roundish, solid; flesh pink and medium in firmness; good quality; did well and worth trying.

**HOWARD'S No. 3 (Perfect):** Originated by A. B. Howard, of Massachusetts; plant healthy, very productive, good grower, light foliage; berry medium to large, solid, conical, bright scarlet, yellow seeds, firm, good quality and good flavor; a good market sort; well worth a trial.

**HOWARD'S No. 7 (Imperfect):** By A. B. Howard, of Mass.; plant strong and a good grower, productive; berry conical, good quality; a good one; worth a trial.

**HOWARD'S No. 96 (Perfect):** By G. W. Howard, of Michigan; plant good grower, healthy, and quite productive; berry medium to large, roundish, dark scarlet, yellow seeds; flesh red all through, solid, firm and of good quality; well worth a trial.

**HOWARD'S 103 (Imperfect):** Originated by A. B. Howard, of Massachusetts; not yet offered to public, sent me for trial; the plant is healthy one, good grower and very productive; the berry is large, roundish, conical, dark scarlet, firm and good grower; the flesh is solid and white inside, seeds imbedded; a good early; will prove a good market sort.

**HAM (Perfect):** By J. H. Black, of New Jersey; a seedling of Mary and Parker Earle, a good grower, plant strong and very healthy, dark foliage; berry large, dark red, smooth and firm; flesh deep red, good quality; well worth trying.

**HEFLIN'S EARLY** (Imperfect): This did very well this year; was one of the best medium earlies; the plant is healthy, the berry a good size for an early; well worth a trial.

**HAVERLAND** (Imperfect): One of the oldest and yet one of the best, most productive and best market berries we have; did very well; so well known needs no description. It is still at the front.

**IRENE** (Imperfect): Did well; plant healthy, good grower, quite productive; berry good color and size, well known; a good one.

**JOE** (Perfect): Seedling sent me by J. H. Black, of New Jersey; the plant is a strong, vigorous grower, healthy and productive; the berry is large, bright scarlet, obtuse, conical, very uniform in size, quality is good, season medium to late; a good one, worth trying.

**KITTY RICE** (Imperfect): Plant a good grower, making plants freely, healthy and productive; berry large, roundish, good color with a gloss; for a fancy market; firm and fair quality; looks fine in the crate; well worth a trial.

**LYON** (Imperfect): Plant healthy and good grower, quite productive; berry dark glossy red, long pointed, red seeds, flesh also red, good size, resembles the old Longfield; mid season to late; berry is good quality, spicy; a good one.

**LATEST** (Imperfect): This came from Massachusetts, by S. H. Warren; the plant is healthy, strong, stools out, makes few runners, quite productive; the berry is large, conical, good crimson color, flesh red, good quality; one of the latest, a good one.

**LOUIS HUBACH** (Imperfect): A seedling sent from Arkansas by Hubach and H; plant healthy, good grower, productive; berry bright dark scarlet, yellow seeds, conical, flesh red all through, and solid, medium in firmness, fair quality.

**LUCCAS** (Perfect): Plant makes runners freely, healthy, productive; berry round, scarlet, medium in size, good quality; did well.

**LESTER LOVETT**: This is so like Gandy it is almost impossible to see any difference between them.

**MRS. FISHER** (Imperfect): Seedling of Hubach and Sharpless, sent me by J. H. Black, of New Jersey; plant strong, healthy, good grower, quite productive; berry large to very large, bright scarlet, medium firm, good quality, late, valuable for near market.

**MEAD** (Perfect): It is a fine grower; the plant is strong and healthy, not a trace of rust; the foliage is dark green; the plant is quite productive; berry is large, roundish, coloring evenly, firm and good quality; a fine one; well worth a trial by all growers.

**MARK HANNA** (Imperfect): A strong grower, healthy, productive, and produces very large berries; somewhat rough, but of good color and fair quality.

**MRS. MARK HANNA** (Perfect): Plant is strong, developed some rust; the berry is large, but not very desirable.

**MRS. MILLER** (Imperfect): Plant large and healthy, free of rust and productive; the berry is large, bright dark red, flesh red, oblong, somewhat flattened and good quality; season medium to late.

**MELLIE HUBACH** (Imperfect): Sent me by Hathaway and Hubach, of Arkansas; the plant is a good grower, healthy, makes runners freely, and very productive; the berry bright scarlet with yellow seeds, conical, blunt at end, slight neck, flesh pink and white in center, acid but good flavor; a good market berry.

**MORNING STAR** (Perfect): Not very desirable.



**MINUTE MAN** (Imperfect): Plant a good grower, strong and healthy and quite productive; berry large, roundish, conical, crimson with yellow seeds; flesh reddish pink all through, medium in firmness, good quality; a good one for maket, even a fancy market.

**MARGARET** (Perfect): One of the fancy kinds grown for a fancy market; it is late; plant healthy; berry large and fine looking; a good one, one of finest.

**MARIE** (Imperfect): Seedling of Crescent; the plant is strong and healthy and quite productive; did very well this year; the berry is roundish, large, somewhat irregular, solid; flesh pink, somewhat sour but spicy, medium firm; a good market berry.

**NEW YORK** (Perfect): Resembles Corsican and Uncle Jim; plant large, strong and vigorous, healthy, medium in productiveness; berry is large, somewhat rough, good flavor, a fancy berry; did well this season.

**NIMROD** (Perfect): Plant originated by J. F. Bever, of Dayton, Ohio; the plant is small, hugs the ground, lies very flat, but is healthy, medium in productiveness; the berry is medium in size, bright scarlet, roundish conical, resembling the old Jersey Queen, solid, flesh pink, very good quality; might do for a fancy berry for the amateur.

**NORTH SHORE** (Perfect): Originated by W. H. Munroe and introduced by Mr. Pratt of Massachusetts, the introducer of Sample and Commonwealth; the plant with me is a good grower but it rusted very much the past season; it had some fine berries on but no doubt the crop was diminished very much by the rust; the berry is large, with yellow seeds; it is quite late in season; will give it another trial.

**NEW HOME** (Perfect): Sent me by the introducer, W. F. Allen, of Maryland; the plant is strong and vigorous, a good grower, resembles the Gandy very much in plant as well as in the berry, same season; I should almost take it for Gandy; large, firm, good quality, but with me no more productive than the old Gandy.

**OOM PAUL** (Perfect): Sent me by Mr. Kevitt, of New Jersey; the plant is large and healthy, making plants freely, only medium in productiveness; the berry is large, rather long and somewhat irregular, dark red and fair quality; did only fairly well.

**OLIVE'S PRIDE** (Perfect): Sent me by Mr. J. W. Hall, of Maryland; the plant is a very vigorous grower, healthy and very productive; the berry is very much like the old Crescent in size and shape; a good market sort; did well the past season.

**OSCAR'S EARLY** (Perfect): I have dropped this variety as undesirable.

**OLYMPIA** (Perfect): I have dropped this as undesirable; it has some good qualities, but not enough to keep it on the list.

**PARSON'S BEAUTY** (Perfect): One of the best; plant is strong and healthy, dark green foliage, and very productive; the berry is large, conical, resembles the Williams in shape and color; yellow seeds, medium in firmness, sub-acid, pleasant taste; one of the best market sorts.

**REYNOLDS** (Perfect): Originated in Delaware and sent me by W. S. Todd, of Delaware; the plant is large, with thick, leathery, dark green foliage, free from rust, a good grower, making plants freely, and productive; the berry is large, dark scarlet, with yellow seeds, flesh red to center, fair quality.

**PRESIDENT** (Imperfect): Plant large, good grower, has some rust, fairly productive; the berry is large and fine looking; made a good showing; would sell well and bring a fancy price; it did very well with me this season; worth a trial.

**PRESIDENT ROOSEVELT (Imperfect):** Plant a good grower, productive, makes plants very freely, but develops rust; did so the past season; berry medium in size, roundish, dull red color with red seeds, solid pink and white in center; flavor is good; not very desirable.

**PEERLESS (Perfect):** Plant is large and strong, dark color and very healthy, a good runner, shy bearer; the berry is large, roundish like Bismarck in appearance, only darker in color, fine flavor and best quality, but does not bear enough; only for the amateur grower.

**PERFECTION (Perfect):** Plant healthy, a good grower, but has some rust; quite productive; berry medium in size, conical, dark scarlet, firm and of good quality; did well with me this season.

**PROF. FISHER (Perfect):** A seedling of Bubach and Sharpless, sent me by J. H. Black, of New Jersey; the plant is large, strong and healthy, good grower and productive, fair quality; resembles Mrs. Fisher; did well.

**RIDGEWAY (Perfect):** Plant is healthy, stools out somewhat, productive; the berry is medium to large, dark bright red golden seeds, roundish; flesh red, firm and very good quality; mid season; had some very beautiful berries; a good one.

**RYCKMAN (Perfect):** Plant large and healthy, good runner, medium in productiveness; the berry is large with a neck, roundish, conical, good quality; is not productive enough with me; could be grown for a fancy market for dessert.

**SEAFORD (Imperfect):** This old variety did very well this year; produced some of the most beautiful berries I had; the plant is subject to rust but is a good grower; makes plants freely, and productive; the berry is long, large, dark crimson, yellow seeds, glossy, of best quality; a very fine one.

**SAMPLE (Imperfect):** One of the best market sorts; does well everywhere; is well known now; it has always done well with me; plant is vigorous grower, healthy and very productive.

**SPLENDID (Perfect):** Another splendid sort well named; a good pollenizer; the plant is a great grower of healthy plants, and very productive; the berry is large round, a bright scarlet, good quality; sold the first picking of Splendid for 15c. per box; one of the best market varieties.

**SUCCESS (Perfect):** Plant is healthy, strong, good grower, productive and early in fruiting; the berry is medium to large, roundish, good scarlet, good flavor; not very firm; all right for home grower.

**SENATOR DUNLAP (Perfect):** This is another grand berry, amongst the best this season; a rampant grower, as vigorous as any we have ever had and very productive of very large, regular, conical berries of a good dark scarlet or crimson; firm, medium, early to late; one of the best market varieties; well worth a trial.

**SUTHERLAND (Imperfect):** Good grower, healthy; berries medium in size; did well.

**SUPERIOR (Perfect):** Made a good return; did very well.

**STEVENS' LATE CHAMPION (Perfect):** Plant is healthy, a fair grower; long runners, dark green foliage, productive; the berry is large, good color; worth a trial.

**TENNESSEE PROLIFIC (Perfect):** One of the best market varieties; plant is a vigorous, healthy grower, not a trace of rust, and very productive; the berry is large, bright scarlet, firm and good quality; has always yielded a bumper crop.

**"THREE W's" (Perfect):** This new one was one of the very best for market; at one of the pickings I picked three boxes without moving; at another later picking I picked a box for every two feet of the row; very



productive; the plant is large, healthy, a vigorous grower; the berry is large, conical, blunt at end, fine bright red scarlet, seeds yellow, fine mild flavor, medium firm flesh, pink to white; one of the best of all this year.

**TEXAS (Perfect):** Plant is healthy, good grower, large size; does not make runners very freely; medium in productiveness; berry is large, red, firm, good quality; a good early.

**UNCLE JIM (Perfect):** Like New York (See Armstrong); resembles Corsican; I had Uncle Jim, Corsican and New York growing side by side; I could see no difference between them either in plant or fruit or season.

**UNCLE SAM (Imperfect):** The plant is large, strong and healthy, a good runner and productive; berry large to very large; if not the largest; roundish, scarlet, red and yellow seeds, flesh pink, good quality and flavor, medium in firmness; a good one; worth a trial.

**VAN DEMAN (Perfect):** One of the earliest; has a long season; does very well in some places and not so well in others; has done well with me; I picked it with the earliest, and it was one of the last; firm and best quality; a beautiful looking berry; looks as if varnished; well known.

**VICTOR (Perfect):** A good new variety sent me by Mr. Crawford; plant is strong, healthy, a good grower, dark green foliage; quite productive of fine looking large berries, dark crimson, with yellow seeds, firm and good quality; will be a good canner; originated by D. J. Miller, of Ohio.

**WONDER, or SAMPSEL'S WONDER (Perfect):** The plant is a strong, healthy grower, and quite productive of large to very large dark bright red berries; good quality; it is medium to late; one of the best; has come to stay with the standards.

**WILSON (Perfect):** Did fairly well, but there are so many better now I only grow it for the sake of comparison with the newer varieties.

**WILD WONDER (Perfect):** Sent me by the originator, J. Shank, of Illinois; a rampant grower, plant small, and rusted very badly; berry small, soft, but good grower; not very desirable.

**WM. BELT (Perfect):** An old standard; made a good showing; kept its place in front; so well known, not necessary to describe it; plant good grower, rusts some; first berry sometimes irregular; the rest are very regular, of conical shape, large and firm and fine quality; a good one.

**WILLIAMS (Perfect):** So well known, no description; did well.

**WARFIELD (Imperfect):** Never did better; most productive of beautiful, dark crimson berries; wants lots of water to do its best.

**WOOLVERTON (Perfect):** Did well; produced some of the finest berries; a fancy variety for fancy market.

**YANT (Perfect):** Plant strong, healthy, light green foliage, good grower and productive; berry is large, regular, with neck conical; good color; mid season; did well.

#### NEW VARIETIES FOR TRIAL.

I have received several new varieties and planted them in a trial plot for next year's fruiting. Most of them have made a good growth, free from rust. They are as follows: Advance, Abundance, Arnouts, Chesapeake, Hummer, Hundred Dollar, Beidler, Jacoma, Beaners, E. H. Ekey, Pride of the Valley, Oak's Early, Somerset Maid, Virginia, May King, Thompson's No. 3, "No. 99," Great Ruby, Nehring's Gem, King Edward.

## LIST FOR GROWERS AND SEASON OF FRUITING.

*Extra Early and Early.*

Van Deman, Michel, Success, Howard's No. 3, Excelsior, Cameron, Howard's No. 103, Johnson's Early, Beder Wood, Lord Sheffield, Texas, Early Hathaway, Springdale B., Fairfield, Ham, Staples.

*Mid-season.*

Burbach, Haverland, Reynolds, Splendid, Bismarck, Sutherland, Marshall, Tennessee Prolific, Senator Dunlap, Parson's Beauty.

*Mid-season to Late.*

Three W's, Victor, Wonder, Glen Mary, Lyon, Marie Saunders, Williams, Wm. Belt, Brandywine, Emperor, Woolverton, President, Kitty Rice, Yant, Mrs. Fisher, Sample, Uncle Sam, Uncle Jim.

*Late to Extra Late.*

Joe, Aroma, Gandy, Abingdon, Cardinal, Stephen's Late Champion, Nettie, Greenville, Latest, Howard's 96, New Home, Elma, North Shore, Commonwealth.

NOTES BY A. E. SHERRINGTON, (*Lake Huron Station*).

The strawberry crop here was a very poor one the past season, owing chiefly to the very dry season; the plants simply died outright with the drouth; the yield was only about one half. The varieties grown at the station as a main crop are Brandywine and Saunders, with a few Michel for early berries. A number of new varieties were planted in the spring.

**BRANDYWINE:** Plant a strong, vigorous grower; fruit large to very large, color dark red, quality the very best; a first-class berry for canning purposes.

**SAUNDERS:** Plant not as vigorous as Brandywine, but makes a good row; fruit large, dark red and firm, also a good canning berry.

**MICHEL:** Plant a great plant maker, needs to be planted in the row 24 to 30 inches, and the rows 4 feet apart; fruit, medium sizes, soft, but a good table berry, but does not yield enough to make it a profitable berry.

NOTES BY CHAS. YOUNG, (*Algoma Station*).

This is without any exception the best money-making crop I can raise. I do not care to tell every enquirer how much an acre of strawberries, at 10c. a box, will total up to, for in many cases my assertion would be received with the customary grain of salt; but I am always willing to advise anyone within reach of a village to try a few hundred plants, and have given away many thousand plants, just to encourage the cultivation. I have grown a good many varieties since I first settled here, but am not yet prepared to say which is the best berry. Some I have discarded altogether; others did exceedingly well for some time. Clyde, for instance, is now useless with me. Others again, highly recommended in the east, are away down with me—Williams, for example—and Texas, highly recommended by some growers,



last season hardly produced one-fifth of a crop. I still keep a few plants set out, even of the kinds that have failed, just for an object lesson to enquirers. I have found that when an old variety begins to fail it keeps getting worse; never better.

There are here sixteen varieties grown for market, the best of which last year was the old Bubach, closely followed by Brandywine, Glen Mary and Tennessee Prolific about equal, making a third of the number. Of the others received for experiment, one dozen of each, some had evidently been too long out of the ground. Judging from the return made last season there is no improvement. I have set out plants of all that made any runners for further trial. I plant in the spring, as soon as the ground is in working order, on ground that had been heavily manured for a previous root crop, in rows four feet apart and two and a half feet between the plants. This may seem a waste of ground to most growers, but land in the north does not cost much per acre, although manual labor does, and by planting at this distance I can do the greater part of the work with the cultivator. I never cover in the fall as it is not needed here, and I only take off one crop. The extent to which I grow is only limited to my ability to obtain pickers. I have advised several to go into strawberries, but still the demand for nice clean, fresh berries far exceeds the supply. Our season is later than in the east and lasts about five weeks. I have some seedlings which so far promise well, obtained from a grower in the east, which may produce something to be reported on later.

NOTES BY G. C. CASTON, (*Simcoe Station*).

I am now growing Fairfield and Lester Lovett, and I want something better than either. I have tried upwards of a hundred varieties of strawberries, and the most profitable of the whole list was the old Wilson and Crescent. But they have had their day, and we have nothing that I know of in the whole list of new varieties to take their place. Many new varieties are very fine berries, but when you pick them three times they are practically done, while the old Crescent and Wilson you could pick for two weeks or more and still be getting good berries. We shall probably never get the ideal strawberry, but if we want a really profitable berry, it will need, in my opinion, to have some Wilson or Crescent blood in it. I have tried a number of seedlings of my own, but never got anything that was worth propagating, until now I have one which I believe is a cross between Crescent and Williams, which I have decided to propagate. But it will need several years of trial under varying conditions, before knowing whether to recommend or discard it.

NOTES BY HAROLD JONES, (*St. Lawrence Station*).

Strawberries were badly injured during the past winter owing to no snow and deep freezing of the ground in March. The varieties that gave the best results are: Woolverton, Williams, and Saunders. William Belt did fairly well, but was injured very much. Brandywine does not bear profitably, and the berry is too seedy, but the plant came through the winter remarkably well.

Of the newer varieties planted they were in most cases destroyed, and I had no opportunity of comparing values.

## VEGETABLES.

NOTES BY PROF. H. L. HUTT, O.A.C., GUELPH.

The following is a list of the varieties of vegetables recommended for general growing as a result of the tests conducted in the Horticultural Department of the Ontario Agricultural College, Guelph:

ASPARAGUS. Conover's Colossal, Palmetto.

BEANS. *Early*: Keeney's Rushless Golden Wax, Wardwell's Kidney Wax; *Medium*: Davis' Wax, Stringless Green Pod, Valentine.

BEETS. Egyptian (for extra early and transplanting): Eclipse Model, Black Red Ball (the darkest of the turnip varieties).

BRUSSELS SPROUTS. Long Island Improved.

CARROTS. *Early*: Early Horn, Chantenay, Danvers, Rubicon (an improved Chantenay).

CABBAGE. *Early*: Early Jersey Wakefield; *Medium*: All Head, Early Summer; *Late*: Danish Round Head, Houser (a very late variety not subject to black rot); *Red*: Mammoth Red Rock.

CAULIFLOWER. Erfurt Extra Select.

CELERY. *Early*: White Plume; *Medium*: Paris Golden Yellow, Chicago Giant (an improved White Plume with extra heavy stalks); *Late*: Evans, Triumph.

CORN. *Early*: Cory, Golden Bantam; *Medium*: Crosby's, Kendall's Early Giant; *Late*: Stowell's Evergreen, Country Gentleman.

CITRON. Colorado Preserving.

CUCUMBER. White Spine, Westerfield Chicago Pickling.

EGG PLANT. Black Beauty.

KOHL RABI. Early White Vienna.

LETTUCE. *For Forcing*: Grand Rapids, Hot House; *For outdoor, loose head*: Black Seeded Simpson; *Heading*: Hanson, Denver Market, Deacon, Cos Trianon.

LEEK. Messelburg.

MUSKMELON. Rockyford, Montreal Market, Hackensack.

ONIONS. *White*: Southport White Globe; *Yellow*: Yellow Globe Danvers, Golden Globe, Prizetaker; *Red*: Red Wethersfield, Red Globe.

PARSNIPS. Hollow Crown.

PEAS. *Early*: Steele-Briggs Extra Early, Nott's Excelsior; *Medium*: Gradus; *Late*: Improved Stratagem, Champion of England.

POTATOES. *Early*: Early Ohio; *Medium*: Burpee's Extra Early; *Late*: Empire State.

PUMPAIN. Sweet Sugar.

RADISH. *For Forcing*: Rosy Gem, Scarlet Globe, Scarlet Conical; *Early*: Scarlet Turnip White Tip, Olive Shape French Breakfast, Long Scarlet Short Top; *Summer*: Chartiers, White Delicious; *Winter*: China Rose, Black Spanish, Osake.

RHUBARB. Victoria.

SALSIFY. Sandwich Island.

SPINACH. Victoria.

SQUASH. *Summer*: Crookneck, Delicata; *Winter*: Hubbard, warted, Golden Hubbard, Marblehead.

TOMATOES. Earliana, Chalk's Jewel, Success, Matchless.

TURNIP. Extra Early Purple Top Milan, Golden Ball.

VEGETABLE MARROW. Long White Bush.



**WATERMELON.** Hungarian Honey, Cole's Early, Halbert Honey, Iceburg.

### BEETS.

Among the 52 varieties tested the following are a few of the promising newer kinds:

**BLACK RED BALL** (Burpee): Shape round, but inclined to get angular with age; tops medium in size; color very dark, flesh color very dark red, zoned with crimson; quality good; season medium.

**EARLY MODEL**: Shape deep globular; size medium; color dark; quality good; tops medium in size and upright; season medium. Well worthy of a trial.

**DARK OX-BLOOD** (Bologanio): Size large; turnip shaped, with large tap root; quality good; color dark; season medium.

**RUBY DULCET** (Johnson & Stokes): Shape nearly round; size medium; color of flesh deep red zoned with crimson and white; quality good; season second early.

**COLUMBIA**: Round, turnip shaped, large size; tops medium; flesh color dark; quality good; season medium.

**CRIMSON GLOBE**: Shape globular; tops medium and upright; flesh color crimson, lightly zoned with white; quality good; season second early.

### CARROTS.

Among the 26 varieties tested, the following are promising new kinds:

**RUBICON**: Originated on Long Island, is of much the same shape as Chantenay; tops small; color of flesh deep red; fine grained. Was one of the heaviest yielders in last year's test.

**SCARLET BEAUTY**: Tops medium in size; shape of root between half-long and long; color deep scarlet; quality good; season medium to late.

**PRIDE OF MARKET**: Half-long, medium size; dark color; quality good; season early.

### CABBAGE.

Among the 68 varieties tested, the following new varieties are worthy of note:—

**HOUSER**: Shape flattened globular; very late; hard header, good keeper; proved to very free from blight; foliage broad, dark green with brown tints.

**DIAMOND WINTER**: Large solid head of the Flat Dutch type; foliage light green; short stem; head broad, flat and well covered with leaves.

**EUREKA and ALPHA**: Are alike, maturing about the same time as Early Wakefield; heads flat, quite deep and solid.

**GLORY OF ENKHOUSEN**: A promising mid-season sort; head medium in size, very solid; shape flattened globular.

**DANISH ROUND HEAD**: This is an earlier, shorter stemmed type of the Danish Ball Head. Heads averaging larger in size than the Ball Head, extremely hard and solid.

### CELERY.

The following new varieties of celery are worthy of note:—

**SNOW WHITE**: This is a select strain of White Plume, and appears to be an improvement on that variety, being truer to type and a little taller.

CHICAGO GIANT SELF BLANCHING (Vaughan): To all appearances a cross between Giant Pascal and White Plume, with the thick solid stalk and excellent quality of the Pascal and self-blanching habit of the White Plume. Is well worthy of a trial.

MAGNIFICENT (Gregory): A new winter celery of a very strong growth; a good keeper, and will compare in flavor with Paris Golden.

#### LETTUCE.

Among the 72 varieties tested, the following are worthy of additional note:—

MORSE: Plant forms a large, well-formed cluster of leaves, and may be used early, very slow to go to seed; leaves large, broad, stiff and blistered, of light green color, crisp and tender, quality good.

A. 1 (Sutton): A crisp variety with large, distinct head, very slow to go to seed; leaves large, broad, thick, blistered and crumpled, of dark green color; crisp and tender; sweet in flavor and of good quality.

DEACON: A heading variety, medium to large in size and slow to go to seed; leaves broad, smooth, thick and soft; light grayish green in color; quality good.

#### ONIONS.

The following are three of the promising new kinds among 55 varieties tested:—

AILSA CRAIG (Sutton): This onion proved to be the heaviest yielder in the lot. Shape, elongated globular; very light straw color; thick skin, white crisp flesh and mild flavor.

GIBRALTAR: Very similar to Prizetaker, but more globular and of lighter color; does not ripen quite so early; bulbs are very tender and tops are of a lighter shade of green than most onions.

GOLDEN GLOBE: Shape elongated globe; skin thin and of light golden yellow color; flesh white and mild; tops small. This variety is a desirable acquisition.

#### RADISH.

Among 68 varieties of radishes tested, the following are a few of the promising newer kinds:—

ICICLE: This is the finest and longest of the early white varieties; crisp and tender; well worthy of a trial.

WHITE DELICIOUS: Good size, crisp, mild, will stand in condition for some time. One of the best of the white summer radishes.

SURPRISE: Oval shaped, deep yellowish brown skin; flesh white and crisp.

#### TOMATOES.

Among the 73 varieties tested this year, the three varieties described below stand out as the most promising of the newer early kinds. The short seasons at Guelph make it impossible for us to mature full crops of the latter kinds.

WEALTHY: Plant fairly vigorous and very productive, proved to be the heaviest yielder in the lot, producing 19 pounds ripe fruit per plant. Fruit medium size, round, smooth, red, firm, and good quality; early.



I. X. L. (Bolgano): Plant fairly compact and productive; season early; fruit medium in size, round, smooth, red, and fairly firm. Ranked third in yield in last year's test.

LIVINGSTON'S GLOBE: Plant large and fairly productive; season medium to late; fruit large, round, smooth, crimson, fairly solid and attractive.

NOTES BY E. E. ADAMS, (*Essex Vegetable Station*).

The season has been a fairly good one, weather conditions being fair to good, although we had a severe drought here during August and a part of September, which prevented some vegetables from developing to their best. The work for this season was not so extensive as is desirable, from the fact that my appointment as experimenter was not made until somewhat late in the season, and after a large amount of our planting was completed.

TOMATOES: However, some work was done, and in tomatoes a good number of varieties was experimented with to show if any advantage can be had in forcing later varieties as to earliness. Some of the early varieties are not always satisfactory, and I wished to note from actual work with the later varieties, if it is possible to so handle them that they can be forced into early bearing, as well as to produce a good crop. Twenty-four varieties were planted, twelve plants of a kind, and all were given same treatment in the hot-house, viz.: Seed was sown about March 1st, transplanted three times, and set in the field about May 24th, some being set with fruit, others showing no fruit or blossoms, but all fine, large stocky plants. These were planted on ground which had been fertilized the previous spring with barn yard manure, and after planting, one ounce of nitrate of soda was applied around the plant and hoed in. The varieties used were Acme, Early Michigan, Stone, Burpee's Combination, Matchless, Chalk's Early Jewel, Royal Red, Buckeye State, First of All, Mayflower, Livingston's Beauty, Fordhook First, Earliana, Magnus, Atlantic Prize, Moore's King of the Earlies, Earlibell, Plentiful, Dwarf Champion and Quarter Century. The experiment showed that the later varieties will not produce early, that the crop is decidedly smaller, that the size of the fruit is much smaller than when grown as a later crop. Burpee's Earliest Pink was also tried, but I can see no advantage in growing it above the varieties in general use. It sets a lot of fruit, but the size does not hold up well into the season. The quality is very good however. The earliest varieties are Earliana, Earlibell, Earliest Pink, Atlantic Prize and First of All; second early, Magnus, Champion, or Century, Fordhook First, Beauty, Early Jewel; and the later varieties are, Matchless Stone, Royal Red, Plentiful and Buckeye State. Most all these do very well on our sandy soil, but Champion and Buckeye State should, I think, have a heavier soil to produce paying crops.

FOR EARLY PEPPERS: I would recommend the Long Cardinal and Neapolitan, and for later the Chinese Giant, although there are several others that give good results, viz.: Sweet Mountain, Ruby Giant, Ohio Crimson, etc.

FOR EARLY CABBAGE: The Extra Early Jersey Wakefield appears to give the best results, although Johnson and Stoke's Extra Early is somewhat earlier, and some growers prefer it. It is a cabbage of fine quality, pointed head, very sweet, crisp and tender, and where the true seed can be procured it will turn off a very nice crop. I find true seed hard to get, and as such is the case, not a very large quantity of it is grown now. Henderson's Early Summer, Early Spring and All Head are also good early varieties, but for

an early crop of even size heads, I know of none better than the Early Jersey Wakefield for our soil.

**CUCUMBERS:** Several varieties of cucumbers have been tested, but I find the Extra Early White Spine and the Arlington White Spine are preferred here, although the Early Cyclone is a somewhat earlier variety, but not as desirable in shape, size or appearance as the Spine varieties. I have used Perfection Hot House, a selection of the Spine varieties, for hot-house work this season, and for color, productiveness and general good qualities, I much prefer it to any other variety so far used. The Extra Early White Spine did not show up so well this year as in 1905, but the Evergreen was, as usual, good. It is a satisfactory cucumber, both for inside and outside work.

**SQUASHES:** Green and Red Hubbard squashes are the best grown with us, while the Large Field is the larger. Other varieties will be tested next season.

**ONIONS:** The best varieties of onions appear to be Giant Rocca, Prize-taker, Danvers, Red Globe, Wethersfield, Mammoth Pompeii and Giant of Gibraltar. The Yellow Globe, Danvers, Red Globe and Red Wethersfield are the best keepers and shippers, the Danvers being the favorite perhaps more on account of its color than any preference in quality. Extra Early Red is grown for first crop. It is of fair size and ripens up early, and can be marketed in August generally.

**CARROTS:** Improved Short White appears to be the best White Carrot, while Chantenay and Danvers are the favorite red varieties.

**CELERY:** White Plume celery is the main early variety, and Winter Queen, Giant Pascal, Golden Self Blanching and Golden Heart are preferred here, although Perfection, Heartwell and Perle le Grande are excellent varieties. Some varieties do well on certain soils, and on other soils are a failure, so growers should test for themselves to see which variety will best suit their purpose.

**POTATOES:** There being so many good potatoes now on the market, it is a hard matter to just say positively which is the best, but for extra early, on good soil, the Early Ohio is the earliest and best cropper of good sized tubers. While in this district they are not largely grown, yet on good soil they do well. Burpee's Extra Early and Bovee are the favorites here, although Sensation is coming to the front, and Mills' Early First Market will likely make a place for itself, as it is a very fine early variety.

**CORN:** Mammoth White Cob Cory corn is the favorite early market corn here, but is not of the best quality for early, and Country Gentleman and Stowell's Evergreen for later.

**BEANS:** Wardwell's Kidney Wax Beans and Golden Wax are the best early yellow podded varieties, and Stringless Green Pod for green pods. The Green podded varieties do not sell well in market on account of poor color, but where known, they sell well, the quality being very desirable.

**MUSKMELONS:** The muskmelons or cantaloupes which do best here are Extra Early Hackensack, Long Island Beauty, Osage, Paul Rose, Emerald Gem, Rocky Ford, and Defender. The Hackensack and Beauty are not of the finest quality, but grow to good size, and are the general favorites in the markets. The other varieties named are much the best in quality, especially the Emerald Gems. Their flesh is salmon color, and when fully matured are of the highest quality.

**SWEET POTATOES:** Jersey Sweet and Yellow Nansemond Sweet potatoes are the varieties grown here, but the Jersey Sweets are much the better in quality, but not\*as heavy producers.



**WATERMELONS:** Halbert Honey watermelon is about the best for home use, while Kleckley Sweets are about equal to them. Peerless and Fordhook Early are also good early varieties, and do well here on sandy soil.

Next season I trust to be able to show progress on other lines which have not been taken up this year.

#### DESCRIPTIONS OF VARIETIES TESTED.

**PRIZETAKER ONION:** Very large, nearly globe shaped, with skin of red straw color, measuring from 12 to 18 inches in circumference; ripens up hard and fine, and presents the handsomest possible appearance, the flesh is pure white, fine grained, mild and delicate in flavor; excellent for fall and early winter.

**GIANT OF GIBRALTAR ONION:** Similar in every way to Prizetaker, but larger.

**MAMMOTH GREEN SQUASH:** Largest squash grown; has been grown to 400 pounds under special culture for exhibition purposes; skin dark green, flesh golden yellow; mostly fed to cattle; quality not good enough for table use.

**RED HUBBARD SQUASH:** Identical in form and quality with the well known Hubbard squash, except that the heavily warted skin is of a beautiful bright red color; flesh, deep golden yellow, fine grained; cooks dry, and is of the finest flavor.

**WHITE CUSHAW PUMPKIN:** Similar in appearance to the Japanese Pie pumpkin, with the exception that the skin is white; flesh of very fine quality.

**HALBERT HONEY WATERMELON:** The finest watermelon for the home garden and for nearby markets; size averages 18 to 20 inches long; skin dark glossy green; flesh, a beautiful crimson; very desirable.

**NEAPOLITAN PEPPER:** The earliest mild red pepper, and the most productive; fruit, measures 4 inches in length by  $4\frac{1}{2}$  inches in circumference. The skin and flesh are bright red; they are thick meated, sweet and very mild, and keep in good condition a long time.

**LONG CARDINAL PEPPER:** The earliest pickling pepper; about 6 to 7 inches long; very hot; a very heavy bearer.

**ROSE OF THE NORTH POTATO:** A very early, fine quality potato; a good keeper; cropper; rose color; fine shape.

**BURPEE'S EXTRA EARLY POTATO:** The finest in quality of all early potatoes, and the earliest variety of good size; oblong shape; very pale brownish skin; few eyes; very productive.

**VERMONT GOLD COIN POTATO:** Strong grower; luxuriant deep green foliage; tubers good size; set closely in hill; skin thin, smooth and glossy, of a light golden tint; flesh, fine grained, of a pure pearly whiteness. A fine potato for main crop.

**CARROT, CHATENAY (stump rooted):** Splendid shape; fine deep scarlet color; roots of the finest quality.

**CARROT, EARLY GEM (Oxheart or Geurande):** Much thicker than the Early Horn; quality excellent, and is almost coreless.

**CARROT, IMPROVED SHORT WHITE:** Roots extra large, half long, smooth, tapering to a point, measuring 12 to 18 inches in length, and from 16 to 20 inches around the top; flesh solid and crisp, rich pearl white color; a very heavy cropper and the easiest carrot to harvest.

**POP CORN, QUEEN'S GOLDEN:** Produces abundantly, pops perfectly white and is of very fine quality.

TOMATO, SPARKS' EARLIANA: The earliest red, smooth tomato, of good size; quite uniform in size, averaging three inches in diameter, and from two to two and a half inches deep; quality good.

TOMATO, JUNE PINK: Ripens just as early as Earliana, foliage quite similar; handsome deep pink in color; not as valuable as Earliana.

TOMATO, CHALK'S EARLY JEWEL: A mid season variety, perfectly smooth; color, bright scarlet, ripening right up to the stem, without cracks or green core; flesh very solid, meaty, very few seeds; skin thin, in fact too thin to make it a good shipper, still it is fine for nearby markets.

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# THE FRUITS OF ONTARIO 1906

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(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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TORONTO:  
Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty  
1907



WARWICK BRO'S & RUTTER, LIMITED, PRINTERS,  
TORONTO.

To the Honourable WILLIAM MORTIMER CLARK, K.C.,

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the pleasure to present herewith for the consideration of your Honour the Report on the Fruits of Ontario for 1906.

Respectfully submitted,

NELSON MONTEITH,

*Minister of Agriculture.*

TORONTO, 1907.





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# Fruit Experiment Stations.

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## BOARD OF CONTROL, 1907.

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# Fruits of Ontario.

## INTRODUCTION.

When the first fruit trees were planted in Ontario, probably about 150 years ago, the settlers had no reliable information to guide them in selecting varieties or in caring for the trees after they were planted. But the experience of these early settlers was taken advantage of by their descendants who, with the additional knowledge possessed, were able to make some progress, although scattered as they were in those early times without good means of intercourse. The dissemination of information from one to another and to the new settlers who were coming in was slow until the railways were built. Then fruit-growing became much more general, as trees could be easily transported from one part of the Province to another. In 1859 a few enthusiastic horticulturists organized the Ontario Fruit Growers' Association. Meetings were held in different parts of the Province, and the people were urged to plant more fruit. This organization has for the past 47 years by its meetings, annual reports, the Canadian Horticulturist, and in many other ways, done very much to bring about the present marvellous development in the fruit industry of Ontario. Realizing that more definite information was needed to guide fruit-growers in the planting of varieties and the culture of fruits, the Association in 1893 urged upon the Government the importance of establishing Fruit Experiment Stations throughout the Province. The idea received the approval of the Government, and in 1894 four stations were established, this number being increased to thirteen in the course of a few years. To these were sent many varieties of fruits, which were tested and reported upon each year by those in charge of the stations. As these experimenters were all practical fruit growers, and in most cases had made a specialty of some kind of fruit, much valuable information regarding varieties and their culture was accumulated by the Department of Agriculture. After the stations were established, it was felt that in due time a hand-book should be published that fruit growers generally might get the full benefit of the information so obtained, and the secretary of the Board of Control, Mr. Linus Woolverton, Grimsby, Ont., was entrusted with the preparation of descriptions and illustrations of the fruits which had been tested. Mr. Woolverton was for ten years engaged in this work, and the results of his labors will be found in the excellent illustrations and full descriptions which appear in this book.

Mr. Woolverton states that, "with a few exceptions, the descriptions have been prepared directly from the fruits themselves, from samples grown in the Province, and the notes of the tree, bush, and vine have been largely made from records taken by the writer during these past ten years of experimental work.

"These descriptions have been verified by comparison with those given in the works of the world's greatest pomologists, such as the 'Dictionnaire de Pomologie,' by Andre Leroy of France; 'The Fruit Manual,' by Thomas Hogg of England; 'The Fruits and Fruit Trees of America,' by Charles Downing, of Newburgh-on-the-Hudson; 'The American Fruit Culturist,' by J. J. Thomas, of New York State; 'Apples of New York,' by S. A. Beach, of Geneva, N.Y.; 'The American Horticultural Manual,' by Prof. J. L. Budd, late of the Iowa State College of Agriculture; 'Plum Culture,' by Prof. F. A. Waugh, of the Massachusetts Agricultural College; 'Apple Culture' and 'Plum Culture,' by W. T. Macoun, of the Central Experimental Farm, Ottawa; 'The Grape Manual,' by Bush, Son & Misener, of Missouri; the Reports of the Michigan Agricultural College, of the American Pomological Society, of the Ontario Fruit Growers' Association, etc., and many other works.



"These have again been modified by the reports of the experimenters in charge of the fruit stations, when it was proved that certain varieties, otherwise desirable, were not adapted to the districts in which they were tested.

"In the case of some of the newer varieties of small fruits, especially strawberries and some of the raspberries, also in the case of some of the larger fruits which are somewhat rare, the descriptions have been in part made from the reports of the experimenters, or from the reports of reliable pomologists. From Professor H. L. Hutt, of the Ontario Agricultural College, and others, photographs and descriptions of some varieties were obtained."

The nomenclature adopted in these descriptions is based on that of the American Pomological Society, but where names which have been commonly adopted in Ontario would not be easily recognized under this nomenclature the old names have been left unchanged.

These descriptions and illustrations were read and examined by the Board of Control, after which they were submitted to other fruit growers before being adopted, and for this work credit is due to Mr. W. H. Bunting, St. Catharines, Ont.; Mr. Murray Pettit, Winona, Ont.; Mr. W. H. Dempsey, Trenton, Ont.; Mr. C. W. Vanduzer, Grimsby, Ont., and to Mr. W. M. Orr, Fruitland, Ont.

In order that those varieties which are not recommended may not be given too prominent a place and thus perhaps be misleading, the illustrations have been confined to those which have been recommended on one or other of the lists of "Fruits Recommended for Planting in Ontario."

The fruits have been divided into four groups in this work, namely: (1) Tree fruits comprising the Apple, Cherry, Peach, Pear, Plum, and Quince; (2) Grape; (3) Bush fruits, comprising the Blackberry, Currant, Gooseberry, and Raspberry; (4) Strawberry. Within these groups the varieties have been arranged alphabetically, as far as possible, for ease in reference.

As it is the object of the Board of Control to make this work of the Fruit Experiment Stations as generally useful as possible to the fruit growers of Ontario, it was felt that the "Fruits of Ontario" would be incomplete if published without cultural directions, hence these are given. The information regarding apple culture is taken largely from the Ontario Agricultural College Bulletin 144, "Apple Culture," by Prof. H. L. Hutt. The lists of varieties recommended are taken from "Fruits Recommended for Planting in Ontario," Bulletin 147, as prepared by the Board of Control. The Spray Calendar at the end of the volume is largely taken from Bulletin 122, "Spray Calendar," by Prof. Wm. Lochhead. The other matter has been specially prepared for this work.

It is hoped that the objects for which "The Fruits of Ontario" was prepared will be accomplished. These are to assist the fruit grower:—

1. In the selection of those varieties most desirable for planting in his particular locality either for home or for market.
  2. By affording a convenient reference in the identification of varieties now grown in the Province.
  3. By furnishing a reliable description of the size, color, general appearance, and real value of the varieties often incorrectly described in magazines and catalogues.
  4. By giving sufficient cultural directions to enable him to make fruit-growing a success.
-

# 1. Tree Fruits.

Among what are commonly classed as the tree fruits are the apple, cherry, peach, pear, plum, and quince.

So confident are the Ontario fruit growers of the future of the industry and the continued profits which will be obtained from the culture of these large fruits, that many acres of trees are being set out annually.

The great importance of the fruit interests may be fairly judged by the following figures for Ontario from the Dominion census of 1901 :—

	Not bearing.	Bearing.	Total Trees.	Bushels.	Value.	Acres.	Capital Value.
Apple Trees.....	1,989,983	7,551,636	9,541,619	13,631,264	\$3,407,815	228,013	\$34,201,950
Peach Trees.....	470,772	811,725	1,282,497	539,482	539,482	38,002	11,400,600
Pear Trees.....	280,175	564,798	844,973	487,759	365,819		
Plum Trees.....	686,628	999,091	1,685,719	337,108	252,831		
Cherry Trees.....	237,792	446,556	684,348	132,177	297,398		
Total .....	3,665,350	10,373,806	14,039,156	15,127,790	4,863,345	266,015	45,602,550

There has been a marked increase in the number of acres planted since the 1901 census was taken, the total number of apple trees, according to the last report of the Ontario Bureau of Industries, being 10,201,766.

## THE APPLE.

There is no part of the world where better apples are grown than in the Province of Ontario, and owing to the hardiness of this fruit it can be successfully cultivated over a very large part of the Province.

From the Ottawa River, which bounds the Province on the east, to the great lakes on the west, a distance of about 500 miles, and from the St. Lawrence River and great lakes on the south to latitude 45 degrees, and even 46 degrees, on the north, a distance of about 280 miles, there are many flourishing commercial apple orchards. These produce annually an average crop of about 35,000,000 bushels of fruit. But apple-growing is not confined even to this area, for scattered here and there over the newer parts of Ontario almost up to the Manitoba boundary are trees which are bearing good apples and supplying the settler with fruit for home consumption.

Owing to the material difference in climatic conditions between the extreme southern and the northern parts of the Province, some varieties of apples are more adapted to certain sections than others, not only on account of their varying degrees of hardiness, but because some kinds produce better fruit in certain sections than in others. Furthermore, as apples grown in the southern parts of the Province do not keep as well as those grown in the northern sections, the fruit matures earlier, and hence does not come into keen competition with, perhaps, the same varieties from other sources. Each part of the Province, therefore, where apples are grown can produce fruit which has a fair chance of commanding the highest price on the market. As these climatic conditions cannot be changed, it behoves fruit growers in the south-western peninsula to make a specialty of growing fruit for the early markets, for there is no other section which can compete so favorably in the production and sale of early apples, especially for the rapidly growing market in the North-west.



The fruit growers in the districts bordering on Lake Huron, Lake Ontario and the St. Lawrence River, where the longest keeping apples of best quality are grown, should make a specialty of winter fruit, and by doing so win for themselves a reputation for this class of apples.

In eastern Ontario, where the McIntosh, Fameuse, and other high class early winter dessert apples are grown so successfully, the fruit grower, though at present handicapped in the growing of late keeping varieties, can obtain for his dessert apples the best prices and thus make his orchard as profitable as those in any other part of Ontario.

For the north, there are a number of varieties, mostly of Russian origin, the hardy survivors through many trying winters in the colder parts of Russia, and these, with the hardy crab apples, are proving a nucleus from which it is believed will be developed, by cross breeding with the best Canadian apples, good dessert varieties which will be grown almost to the extreme northern limits of the Province of Ontario.

#### SELECTION OF VARIETIES.

One of the most important things to be considered in planting an orchard is the selection of varieties. Some of the most serious mistakes in the past have been made in this particular. In many cases worthless varieties have been planted, which is hardly to be wondered at when planters had little more to rely upon regarding varieties than the exaggerated descriptions given by travelling tree agents. But in these days when we have reliable information about all classes of fruits for all sections of the Province published annually and distributed free, as is done in the report of the Ontario Fruit Experiment Stations, there is no excuse for planting anything but the very best varieties suited to each section.

One mistake to be avoided is that of planting too many varieties, particularly in commercial orchards. A half dozen good winter sorts have been found to be sufficient. For home use, however, the list might be doubled, or at least lengthened, to suit the preferences of all members of the family. There should, in any case, be varieties enough to cover the season and give a bountiful supply from earliest to the latest. One or two summer varieties, three or four autumn, and half a dozen winter varieties would be about the right proportion of each to plant.

Another precaution which has to be taken in planning a commercial orchard, is that of planting too large a block of any one variety. For convenience in harvesting it is no doubt best to plant trees of the same variety near together, but on the other hand if these blocks of one variety are too large it may be the cause of poor crops, for there are many varieties which are self-sterile, that is, the pollen which they produce will not properly fertilize their own flowers, although it may be quite potent on the blossom of some other variety. This question has not been sufficiently studied to warrant us in saying definitely just which varieties are self-sterile and which are self-fertile, although from experiments which have been made, the following varieties appear to be more or less self-sterile: Yellow Bellflower, Chenango, Gravenstein, King, Northern Spy, Primate, Rambo, Red Astrachan, Roxbury Russet, Golden Russet, Spitzenburg, and Tolman Sweet. None of these should be planted in blocks of more than three or four rows, without some other variety intervening which blooms about the same time. In orchards where such a mistake has been made, it can be rectified most readily by grafting every third or fourth row with some variety which will insure cross-fertilization.

Both tree and fruit must be considered in the selection of varieties. The tree must have sufficient hardiness for the locality, and it is in this particular that the Fruit Experiment Stations give valuable information to intending planters.

Productiveness is also an important characteristic. Unfortunately some of the varieties of most excellent quality, such as the Blenheim and King, are lacking in this respect, and, while it may be desirable to plant these for home use, still such a defect is a serious one in a commercial orchard. The age of bearing is another characteristic which varies greatly in different varieties. The Northern Spy, for instance, often requires ten to fifteen years before it comes in bearing, while Ontario, Wealthy, and many of the Russian varieties sometimes bear even in the nursery rows, or at least in a year or two after they are transplanted into the orchard. This is a difference which may well be taken advantage of in the arrangement of varieties in the orchard, for, as a rule, those which are slow in coming into bearing make larger trees and are longer lived, while those which begin early and bear heavily are more or less dwarfed in their growth and the trees are shorter lived. For this reason trees of the precocious varieties are often planted as fillers between rows of the later bearing and larger growing kinds.

The most desirable qualities in the fruit itself depend largely upon whether it is for the market or for home use. For home use, good quality is the first consideration. Usually those having a spicy or characteristic flavor, such as the Spy, King, or McIntosh, are most desirable. Apples with an acid or subacid flavor are most in demand on the market; nevertheless a good sweet apple is often much appreciated for home use. For the market, good appearance is the first consideration. No doubt in time buyers will be more discriminating and demand good quality rather than fine appearance, but at present the most saleable apples are those that keep well, are of fair size and an attractive color. Well colored red apples are those in the greatest demand in the Old Country market, a point which should be remembered in selecting varieties intended for export. Good shipping qualities have also to be considered in the selection of commercial varieties, although no doubt the improvement in methods of packing and shipping may render this of less importance in the future than it has been in the past. The Ben Davis apple has long been recognized as one of the best shipping varieties, on account of its firmness and good keeping qualities. On the other hand, the McIntosh is not a long keeper, and is so easily bruised that it cannot be shipped satisfactorily in barrels. But with improved methods of packing and shipping, it may be shipped to any of the European markets and even placed on sale with the Ben Davis, and it is a question how long the Ben Davis, with its inferior quality, will be able in such competition to hold its place in the market. Those who champion the Ben Davis may take exception to the comparison just made because of the relative difference in season of the two varieties. Nevertheless, we believe that it will be safer in the future for growers to look more to the quality of the variety than has been done in the past, for in due time buyers will no doubt become more discriminating and demand apples of the very best quality.

#### ORDERING AND OBTAINING TREES.

A complete list of the nurserymen of this Province is published each year in the Report of the Inspector of Fumigation, and most of our leading nurserymen advertise in the agricultural and horticultural papers. Upon application, any of these men are glad to quote prices at which they can supply stock.

It is well, when ordering nursery stock, to order early. Too many leave such a matter till planting time, when they might as well have had their order in several months sooner. By ordering early they are more likely to obtain just what is wanted, and if the nurseryman has not the desired varieties on hand, he can obtain them elsewhere by the time they are needed.

When the trees arrive from the nursery, it is best to unpack them as soon as possible, and, if it is not convenient to plant them at once, the roots should be



spread out and buried in a deep trench till they can be permanently planted. The longer the trees are to remain in this position the more carefully they should be heeled in.

#### VARIETIES RECOMMENDED.

*General Lists.* After testing a large number of varieties of fruit at the various fruit stations, the Board of Control has decided upon the following as the most desirable for general planting.

*District Lists.* The District Lists given by the various experimenters show varieties especially adapted to the sections represented by their stations.

The term *Commercial* is intended to include the varieties most desirable for market purposes, and the term *Domestic* those most desirable for home uses, either cooking or dessert.

These lists are given, as far as possible, in the order of ripening.

It is realized that there are many varieties not included in these lists which may do well *under special conditions*, yet which are generally not considered as desirable as those mentioned.

#### GENERAL LIST OF THE MOST VALUABLE VARIETIES FOR MARKET APPROVED BY THE BOARD OF CONTROL.

##### *Summer.*

*Astrachan:* Adapted to all sections except the extreme north.

*Duchess:* Adapted to all sections.

##### *Fall.*

*Gravenstein:* Adapted to all sections except the St. Lawrence River and other northerly portions of the Province.

*Wealthy:* Particularly valuable for northern sections.

*Alexander:* Especially for northern districts.

*McIntosh:* Adapted especially to the St. Lawrence River district, but can be grown over a much wider area.

*Fameuse:* Adapted especially to the St. Lawrence River district, but succeeds well over a much wider area.

*Blenheim:* Adapted to all sections except the St. Lawrence River district and northerly portions of the Province.

##### *Winter.*

*King:* Adapted only to the best apple sections, and succeeds best when top grafted on hardy stocks.

*Hubbardston:* Adapted to the best apple sections.

*Greening:* Adapted to the best apple sections.

*Baldwin:* Succeeds best on clay land, and is adapted to the best apple districts.

*Spy:* Adapted to the best apple districts, but can be grown with success farther north by top-grafting on hardy stocks. This is also a good method of bringing it into early bearing.

*Ontario:* An early and abundant bearer, but short lived. Recommended as a filler among long-lived trees. Adapted to same districts as Northern Spy, which it somewhat resembles.

*Stark:* Adapted to best apple districts.

#### VARIETIES ESPECIALLY ADAPTED TO HOME USE.

##### *Summer.*

*Transparent:* Adapted to all sections.

*Primate:* Adapted to best apple sections.

*Sweet Bough:* Adapted to best apple sections.

*Duchess:* Adapted to all sections.

*Fall.*

*Chenango*: Adapted to best apple sections.

*Gravenstein*: Adapted to best apple sections.

*Wealthy*: Especially adapted to northern sections.

*McIntosh*: Especially adapted to northern sections.

*Fameuse*: Especially adapted to northern sections.

*Blenheim*: Adapted to best apple sections.

*Winter.*

*King*: Adapted to best apple sections. Should be top grafted.

*Wagener*: Adapted to best apple sections.

*Swayzie*: Adapted to all sections except most northerly.

*Greening*: Adapted to best apple districts.

*Tolman*: Adapted to best apple districts.

*Spy*: Adapted to best apple districts, but will succeed farther north if top grafted.

*Mann*: Adapted to best apple districts, but will succeed farther north if top grafted.

## HARDY VARIETIES RECOMMENDED FOR SECTIONS NORTH OF LATITUDE 46 DEGREES.

*Summer.*

Yellow Transparent, Charlamoff.

*Fall and Winter.*

Duchess, Wealthy, Hibernial, Longfield, Patten, Whitney, Hyslop, Scott Winter.

## CRABS SUITABLE FOR THE WHOLE OF THE PROVINCE.

*Whitney*: A large crab of high quality, suitable for planting in the extreme north where other apples will not succeed. May be used for dessert or cooking.

*Martha*: An early crab of fair quality.

*Transcendent*: Yellowish crab, season early autumn.

*Hyslop*: Dark, rich red crab, of late season, quality only fair.

## DISTRICT LISTS RECOMMENDED BY THE EXPERIMENTERS.

*Niagara District*: By Linus Woolverton, Grimsby, Ont.

*Commercial*: Astrachan, Duchess, Gravenstein, Alexander, Blenheim, Cranberry Pippin, Hubbardston, King, Greening, Baldwin, Spy.

*Domestic*: Early Harvest, Sweet Bough, Duchess, Chenango, Gravenstein, Shiasawsee, Fall Pippin, Fameuse, Swayzie, Wagener, Yellow Bellflower, Spitzenburg, Tolman.

*Bay of Quinte District*: By W. H. Dempsey, Trenton, Ont.

*Commercial*: Duchess, Gravenstein, Trenton, Alexander, Wealthy, Fameuse, McIntosh, King, Greening, Baldwin, Ontario, Seek-no-Further, Spy, Tolman, Ben Davis, Stark.

*Domestic*: Benoni, Primate, Gravenstein, Fameuse, McIntosh, Grimes, Greening, Ontario, Spy, Tolman, Swayzie.

*Burlington District*: By A. W. Peart, Burlington, Ont.

*Commercial*: Astrachan, Duchess, Wealthy, Ribston, Blenheim, King, Greening, Baldwin, Spy.

*Domestic*: Astrachan, Sweet Bough, Gravenstein, Wagener, Seek-no-Further, Golden Russet.

*Lake Simcoe District*: By G. C. Caston, Craighurst, Ont.

*Commercial*: Duchess, Peerless, Alexander, Wolf River, Blenheim, Pewaukee, Stark, and the following if top-worked on hardy stocks: Greening, King, Ontario, Baldwin, Spy.

*Domestic*: Astrachan, Primate, St. Lawrence, Fameuse, McIntosh, King, Spy.



*Lake Huron District:* By A. E. Sherrington, Walkerton, Ont.

*Commercial:* Astrachan, Duchess, Wealthy, Fameuse, McIntosh, Blenheim, Greening, Baldwin, Spy, Golden Russet, Ben Davis.

*Domestic:* Transparent, Astrachan, Duchess, McIntosh, Grimes, Blenheim, King, Spy, Golden Russet.

*St. Lawrence District:* By Harold Jones, Maitland, Ont.

*Commercial:* Duchess, Alexander, Wolf River, Scarlet Pippin, Fameuse, McIntosh, Baxter, Milwaukee, Golden Russet.

*Domestic:* Transparent, Brockville Beauty, Scarlet Pippin, Fameuse, McIntosh, Blue Pearmain, Golden Russet, Yellow Bellflower.

*Algoma District:* By Charles Young, Richard's Landing, Ont.

*Commercial and Domestic:* Astrachan, Transparent, Duchess, Charlamoff, Gideon, Longfield, Wealthy, Scott Winter.

#### SITE OF THE ORCHARD.

The large inland lakes surrounding the southern portion of this Province have a wonderfully ameliorating effect upon the climate for some distance from their shores, and as a rule, our most extensive commercial orchards are in proximity to these large bodies of water. There are, however, in the interior many localities quite as favorable for fruit growing, but in such locations the question of site and exposure has to be more carefully considered. The site usually selected for the orchard is one near the buildings, which may be all right if these are on the highest ground, for such grounds are not only best drained but are least liable to untimely frosts. Good atmospheric drainage is often quite as important as good water drainage, and cold air, like cold water, runs down hill. Only a few feet of elevation above a wide adjoining area may be sufficient to enable trees in full bloom to escape a frost which destroys the crop on the lower level. On level lands there is practically no atmospheric drainage and the orchardist must take his chances and make the best of it.

#### EXPOSURE.

Where the land is rolling, and there is a choice of exposure, the situation should be carefully considered, for in many cases this may be the difference between success and failure. As to which is the best exposure, depends largely upon the surroundings. In proximity to large bodies of water the best exposure is toward the water. In localities subject to late spring frost the safest exposure is towards the north, as this helps to retard the period of bloom till danger of frost is past. On a northern exposure trees are less likely to suffer in times of severe drouth, and there is also not so much injury from sun scald, a most serious trouble in northern localities. For the reasons given a northern or eastern aspect is, as a rule, preferable to a southern or western one, and also because there is less exposure to our strongest prevailing winds, which come from the south-west.

#### WINDBREAKS.

Protection from the prevailing winds is another matter that requires due consideration. The shelter accorded by a high hill or natural belt of timber is perhaps the ideal one, but when these do not exist, the planting of a windbreak is necessary. The best trees for windbreaks are some of the evergreens, such as Norway and White Spruce, the Austrian and Native White Pines. The Norway Spruce is most used because it is a rapid grower, and the young trees may be

obtained very cheaply. The windbreak should be planted at the same time as the orchard; it will then be effective by the time the trees come into bearing. A single row may be sufficient, although in very exposed places, a double row, with the trees set alternately, is preferable. The trees should be at least six or eight feet apart, and even ten or twelve feet is better when the trees grow up. The trees should not be planted nearer than forty feet from the first row of apple trees, as if planted too near, drifts of snow may cause injury in winter, and insects are more troublesome in summer where there is not a good circulation of air. The trees in the windbreak should be well cultivated, the same as the trees in the orchard, until they become well established. Neglect of this is the main cause of failure in setting out windbreaks.

#### THE SOIL AND ITS PREPARATION.

The apple tree readily adapts itself to a great variety of soils, yet there are certain kinds upon which it does much better than others. Light sandy soils are usually deficient in plant food, and are not retentive of it when fertilizers are applied to them. The trees upon such soils may do fairly well for a time, but as a rule they are less productive and shorter lived than on heavier soils. On the other hand, heavy clay soils may contain plenty of plant food, but they are difficult to work, and unless very carefully managed bake so hard that the tree will not thrive upon them. The ideal soil is a happy mean between these extremes, a friable loam. It may be called a sandy or a clay loam, as either sand or clay predominates in its composition, and is all the better if of a limestone formation upon an open subsoil.

One of the first requisites in any orchard soil is good drainage. Fruit trees will not thrive upon undrained soil. If the land is not naturally well drained, it should be thoroughly underdrained.

Good preparation of the soil previous to planting is very essential. Trees set on unprepared soil are seriously handicapped at an important stage of their life and often they never overcome it. Land which has been exhausted by grain production is in poor condition for the growing of trees, although it may be greatly improved by growing and plowing down two or three crops, such as rye, clover, or vetches, as a green manure. Probably no other crop leaves the ground in better mechanical condition for the growth of trees than clover. Its roots penetrate the soil deeply and leave it well filled with vegetable matter or humus.

There has been much diversity of opinion regarding the value of subsoiling in preparing the land for trees. But there is little room for doubt that it is of much benefit on land where the subsoil is hard and impervious to water. The subsoiler should follow in the furrow of the ordinary plow, loosening the subsoil as deeply as possible. Where this is not done, clover roots are the next best thing as subsoilers.

The preparation of the ground for planting should begin by a good deep plowing in the fall, and it would be all the better if it could be ribbed up as is now frequently done in preparing ground in the fall for spring seeding. This insures good surface drainage and quick drying of the ground in the spring. All that would then be required in the spring would be to harrow down the ridges and loosen up the ground as deeply as possible with a spring tooth cultivator.

#### PLANTING.

Great care should be taken and good judgment shown in laying out the orchard and in planting the trees.

The proper distance apart for planting depends altogether upon the ultimate size which the trees may attain, which in turn depends upon the variety, the soil,



and the locality. The varieties grown in our most northern orchards seldom spread more than twenty or twenty-five feet, while the kinds grown in the more favored apple sections of Southern Ontario often have a spread of forty feet. The best guides to intending planters is to observe carefully the distances required for full grown apple trees in the neighborhood. In southern Ontario this will be found to be from thirty-five to forty feet, throughout central Ontario thirty to thirty-five feet, while in the northern sections where only the hardiest kinds are grown, twenty-five feet will be found quite sufficient. It is wise to allow plenty of space, so that there will be no crowding when the trees have reached their full size. Planting too close is a far more frequent and serious mistake than planting too far apart.

A plan quite frequently adopted, particularly in some of the large American orchards, is to use some of the small-growing early-bearing varieties, as fillers between the large-growing varieties. The Duchess, Ontario, and Ben Davis, for example, are planted alternately with large growing kinds, such as Baldwin, Greening, and Spy.

In such cases, the large-growing kinds are set at the maximum distance apart, and the smaller kinds between them. By the time the larger kinds begin crowding, the smaller ones will have paid for their keep and that of the others, and can be cut out to make room for the larger trees. The greatest objection to this plan is the danger that the fillers may be left so long before they are removed that the value of the whole orchard may be impaired.

There is a diversity of opinion as to the best time for planting, although it may be done successfully any time when the tree is dormant, either in the spring or autumn. In favorable localities and with hardy varieties it may be done quite as well one season as another, but for general planting the spring is the safest time in our rigorous climate.

The trees should be planted in rows as straight as it is possible to make them. Straight rows add not only to the appearance of the orchard, but to the convenience of cultivation. One of the best means of getting the rows straight is to stake out the position for each tree before beginning to plant.

Great care should be taken to prevent the roots of the trees drying while they are out of the ground. If it happens to be hot and windy at the time of transplanting, it is a good plan to puddle the roots in soft mud as soon as they are taken from the packing box or trench, and in carrying the trees about the orchard, it is well to keep the roots covered with a wet blanket or piece of old carpet.

The hole for the tree should be wide enough to hold the roots without cramping or crowding, and should be deep enough to admit of a few inches of fine mellow surface soil being filled in the bottom, and still have the roots an inch or two deeper than they were in the nursery row. The roots should be spread out in their natural position and should be covered with moist mellow surface soil. It is well, in digging the holes, to have the surface soil placed at one side and the subsoil on the other, so that in refilling, the surface earth may be placed next the roots and the subsoil left for the top. If the soil has been properly prepared it is seldom necessary to water the roots at the time of transplanting, but care must be taken to ensure the soil moisture from below coming up to the roots. This may be done by tramping the earth firmly as soon as the roots are well covered, and leaving only the top soil untramped to act as a mulch and retain the moisture below. The neglect of this firming of the soil around the roots is one of the most common causes of failure in the transplanting of trees. If watering is necessary, a small pailful poured in as soon as the roots are nearly covered, is of more use than a half dozen on the surface after the planting is finished.

All torn, bruised, or injured roots should be cut back, with smooth cuts, to sound wood. Smooth cuts callous over quickly and new roots are the more readily sent out. Trees obtained from the nursery, no matter how carefully they may have been taken up, have lost the greater part of their root system, and in order that they may make a satisfactory growth when transplanted the top must also be cut back to a similar extent to restore the balance. This cutting back, however, can be most satisfactorily done after the trees are planted, when they are held firmly by the soil, and more careful attention can be given to shaping the head of the young tree. Closely associated with the heading back of the top at the initial pruning of the tree, is the question of determining the height at which the head should be formed. On this, as in many other points of orchard management, there is a variety of opinions. Some prefer high heads, because of the greater convenience for cultivation and working underneath; while others prefer them low, because of the greater convenience in pruning, spraying, and harvesting. There are other reasons, however, why low headed trees are preferable; in exposed locations the trees and crop are less likely to suffer from violent winds, and in northern localities the trees with short trunks and low spreading branches are much less subject to injury from sun scald, the most serious tree trouble of the north. At the Algoma Fruit Experiment Station it has been found advisable to start the head not more than a couple of feet from the ground, while in the more favored sections the custom is to have at least four feet of trunk. This is the height at which the head is usually started on two or three year old trees as obtained from the nursery, and for this reason it is better for the northern planter to get two year old, rather than three or four year old trees, so that he can start the head at whatever height he wishes. In this connection it may be stated that tree trunks do not lengthen, except by pruning off the lower branches, so that at whatever distance from the ground the lower branches are left, that will be the permanent length of the trunk.

Three branches are enough to leave to form the main limbs or framework of the tree top. These should be evenly spaced around the trunk to give a well balanced and symmetrical top, and they should also be placed on the trunk so as to distribute evenly the weight of the top and avoid bad crotches which are liable to split down with weight of crop. It is particularly important at this stage that great care should be taken to train the young tree in the way it should go, and much can be done in training and directing growth by heading back to buds pointing in the direction we wish the new branch to take.

#### CARE OF THE ORCHARD AFTER PLANTING.

In a newly-planted orchard the trees occupy but a small portion of the land, and they cannot be expected to give any returns for at least five or six years. It is advisable, therefore, that some other crop be grown in the orchard which will pay for the labor spent upon it till the apple trees come into bearing and require all the space. It is by injudicious cropping, however, that young orchards are often most seriously injured. It should not be forgotten that the apple trees are the first consideration, and that whatever cropping is done in the orchard must not interfere with them in the least.

In some cases the spaces between the trees may be planted with small fruits, such as raspberries, currants, or gooseberries, but these should not be planted within nine or ten feet of the tree, nor should they occupy ground more than six or seven years.

Hoe crops, such as corn, roots, potatoes, etc., have generally been recommended as the best to grow in the orchard, because of the opportunity they afford for cultivation. This may be all right as far as it goes, but these crops



draw heavily upon the plant food in the soil and return very little in the way of roots or plant residue. If such crops are successively grown for several years, they are almost sure to seriously deplete the soil of fertility, unless extra care is taken to maintain it by the application of manure or fertilizers. Probably on the whole the least objectionable cropping is a well arranged rotation of crops, in which clover and hoed crops alternate frequently enough to keep the ground in good condition. Some of these crops harbor mice, and whenever such occur in the rotation precautions must be taken at the approach of winter to protect the trees from their ravages.

During all this intercropping a strip in which the trees are growing must be left for regular cultivation, and this strip should be widened each year as the trees increase in size. No cropping should be attempted under the head of the trees, and intercropping should be discontinued as soon as the trees require all the space.

### CULTIVATION.

Cultivation improves the physical condition of the soil by breaking up the soil particles and presenting a greater feeding surface to the roots. By warming and deepening the soil, it permits of a greater depth of feeding area. Every soil particle is surrounded by a thin film of moisture, consequently the finer the soil particles the greater the surface area to hold moisture. A dry earth mulch or dust blanket on top checks the evaporation of moisture from below. Cultivation renders plant food more readily available by promoting nitrification and the decomposition of organic matter in the soil.

Knowing this to be the case, many growers have given thorough cultivation a fair trial, and have satisfied themselves that for most sections of Ontario clean cultivation with cover crops is more profitable than sod. There are indeed few cases where sod is more desirable than cultivation; these are where the soil is fertile and contains an abundant supply of moisture.

As soon as possible after the trees are set, a strip on each side should be cultivated to loosen up the soil which has been tramped down during planting. Each year this strip should be widened, so that no crop intended for harvesting is grown beneath the branches of the trees.

Cultivation should begin as early as the ground is dry enough in the spring. The first tool to be used in most cases is the plow. It is well to plow the land about five inches deep during the first few years after setting to encourage deep rooting. As the trees get older the depth of plowing should be gradually lessened, until by the time the orchard is in full bearing, three to four inches is sufficient.

It is a good practice to roll each evening what has been plowed during the day, particularly if the ground is inclined to be lumpy. The soil is much more easily pulverized when freshly plowed than if allowed to lie exposed to the weather for several days.

### COVER CROPS.

The value of growing cover crops in the orchard is being more appreciated every year by fruit growers, who in times past viewed with alarm the injury which occurred from root killing where the soil was bare in winter. A cover crop is a covering of vegetation in the orchard during the latter part of summer and early winter, and is useful in many ways, of which the following are some of the most important: (1) A cover crop, by adding a large amount of fibre to the land, prevents hard soils from cementing or puddling. (2) On bare and rolling

land, where the rains quickly run off and snows blow off the high portions, a growing crop tends to hold these until they have time to soak into the soil. (3) Land covered by a growing crop dries out more quickly in the spring, owing to the transpiration of moisture through the leaves, and consequently may be plowed under earlier in the season than land which is bare. This is a very important point, as it enables the orchardist to gain several days in the busy season of spring. (4) Ground covered with vegetation will hold the snows in winter and thus prevent deep freezing, thereby avoiding the liability of root killing. (5) A cover crop affords the most economical means of furnishing a supply of humus in the soil. (6) The roots of a cover crop assist the tree roots in rendering available certain mineral plant food in the soil. (7) A large amount of plant food is liberated in the soil after the tree growth has ceased. This is taken up by the growing crop and held in a readily available form for the following season. (8) Leguminous crops, such as clover, vetch, alfalfa, peas, and beans, by virtue of certain bacteria which form nodules on the roots, are able to assimilate nitrogen from the air. As nitrogen is one of the most expensive fertilizing elements, the value of this class of plants cannot be too highly appreciated.

Cover crops should be sown about the middle of July so that they may make a good growth the same season, and in the colder parts of the Province, the seed may be sown during the first week of July, as the season is shorter than in the more favored sections. It is also wise to check the growth of the trees about this time, so that they may mature their wood before winter sets in. The thorough tillage which should have been practised up to this season, leaves the ground in the best possible condition to give the young plants a start. The crop should be plowed under as early in the spring as possible, and cultivation should begin at once. If the crop is large and the soil rather dry, this is imperative, as the large amount of vegetable matter turned under seriously interferes with capillary action and leaves the surface soil unduly dry.

That a cover crop may be of the greatest value, it should be capable of withstanding the winter and continuing its growth next spring. This, however, is not a necessity, as many of the ordinary crops which will not live through the winter are valuable for this purpose.

Different soils require different kinds of crops. This has led to a division of cover crops under several classes. The most important are the nitrogen gatherers, which through the agency of the nodules on the roots can make use of the nitrogen of the air. Such plants as clover, vetches, alfalfa, peas, and beans, belong to this class, and should be used where the soil is deficient in nitrogen. Another class is known as the potash liberators, such as turnips and rape, which, although they do not add anything to the soil, as do the leguminous plants, yet change the form of the mineral potash so that it may be more readily acted upon by the roots of succeeding crops. Then there is a third class, commonly grown, such as rye, oats, and buckwheat, which are valuable chiefly on account of the humus formed by their development.

Hairy Vetch, sown at the rate of thirty-five pounds per acre, forms a very close mat over the ground. This is a valuable crop owing to the fact that it collects nitrogen, lies close to the ground so that it does not inconvenience the pickers when gathering the fruit, and also withstands the cold winter and continues its growth early in the spring.

Red Clover and Mammoth Clover, sown at the rate of twenty pounds per acre, are about equal in value, make a fair growth, are low growing, and winter well on drained soil.



Crimson Clover has not made quite as good growth as the red or the mammoth, nor will it stand the winter in the colder sections, which is a serious disadvantage.

Alfalfa, or lucerne, is one of the best leguminous crops for dry land. It makes a good growth and winters well. There is a mistaken impression that alfalfa will not make sufficient top the first season. Thirty pounds of seed per acre, sown in July, will give a good stand the same season.

Rape has given good results in the colder sections. It makes a heavy growth of stiff stems, which, although nearly all killed in winter, stand up well enough to hold the snows. Rape can scarcely be recommended for fruiting apple orchards, as it remains wet the greater part of the day, making the work of harvesting very unpleasant. It may be used to good advantage in the rotation, especially if few fruits are to be harvested.

Rye, the favorite crop of many growers, gives a fair amount of top and winters well. One advantage of rye is that it may often be grown on lands not in a physical condition for the growth of clover. In this way humus may be added to the soil, and conditions made more favorable for the growth of clover.

#### MAINTAINING FERTILITY.

The maintainance of fertility is more frequently neglected in the orchard than on any other part of the farm. Trees, even on poor land, will produce fruit, but it is only on soils where fertility is maintained that paying crops are produced. Each year that fruit is harvested some plant food is removed. If profitable crops are to be expected the supply of plant food in the soil must be maintained.

The most essential elements for the production of fruit are nitrogen, potash, phosphoric acid, and lime. Nitrogen encourages leaf and wood growth, which are essential to the development of the tree and to the production of the best quality of fruit. Potash is an essential constituent in the growth of fruits. It constitutes a large proportion of the ash of the wood and more than 50 per cent. of the ash of the fruit, and is also associated with the development of flavor in the fruit. Phosphoric acid is essential to the development of the tree and the proper ripening of the fruit. Lime is not in itself an essential element, but assists in liberating plant food. On a soil deficient in lime, growth often continues so late that the wood does not mature nor the fruit ripen properly.

Barnyard manure supplies nitrogen, potash, and phosphoric acid, and improves the physical condition of the soil. Cover crops may take the place of barnyard manure to improve the physical condition of the soil, and the leguminous ones may add all the nitrogen required. Concentrated fertilizers or commercial plant foods may be used in conjunction with cover crops to supply all the plant food necessary for the growth of trees. In the use of commercial fertilizers it is well to proceed cautiously, and, by carefully conducted experiments, ascertain what elements of plant food the soil may be deficient in, and what amounts it may be necessary to apply to get the best results. Unleached wood ashes contain a small quantity of phosphoric acid, seldom exceeding  $1\frac{1}{2}$  per cent., a larger amount of potash, varying from 5 to 7 per cent., and also a certain amount of lime. Where pure wood ashes can be procured at a price not exceeding ten cents per bushel, they afford an economical source of plant food. An application once in two or three years will usually give excellent results, especially on light soils which are most lacking in potash. Muriate of potash is another economical form in which to obtain potash. Phosphoric acid may be purchased in the form of superphosphate. Nitrogen may be procured in the form of sodium nitrate, but

leguminous cover crops furnish a much cheaper source of this essential but costly element.

### PRUNING.

The object of pruning is to form a vigorous and evenly balanced tree, which will produce annually a paying crop of good-sized, well-colored fruit. Unpruned trees produce many small-sized unsalable apples. Pruning lessens the number of apples per tree, but at the same time increases the size and improves the quality of those produced. A heavy crop of good-sized fruit is not so serious a drain on the vitality of the tree, nor on the fertility of the soil, as the same weight of smaller apples would be, for it is the production of the seed which makes the greatest drain on the tree and soil.

Pruning should be practised every year without fail from the time the tree is planted. In this way the operation is never a severe one, and the removal of the large limbs becomes unnecessary. Limbs growing too strongly in any particular direction, which are liable to upset the balance of the tree, should be headed back. Where two limbs cross, one of them should be removed. Branches growing across, from one side to the other, should be cut out. Care should be taken to leave sufficient twigs in the centre to protect from sun scald. Much may be done in directing growth by heading back to a bud pointing in the desired direction. It is while the trees are young that the greatest care in training is required.

A properly pruned apple tree should be open enough to admit sunlight and permit of free circulation of air. Its lower branches should be trained high enough to admit of easy cultivation, yet the top should not be so high that spraying and harvesting are rendered difficult. Varieties differ more or less in their habit of growth, and, while it may be advisable to modify this to some extent, it is not well to attempt to change it unduly. Long bare branches should be avoided, and the formation of fruit spurs should be encouraged on all parts of the tree.

The best time for pruning is just before growth begins. Wounds made at that season soon heal over. It is not well to prune when there is frost on the wood. Pruning while the tree is dormant tends to increase the growth of wood. Summer pruning encourages the formation of fruit buds, but it is not advisable to do much of it, as the removal of any considerable amount of the leaf area tends to check the vigor of the tree. Pruning by the removal of buds may be practised at any season of the year.

The thumb and finger may be used for the removal of sprouts and buds during the summer. A pair of small pruning shears will remove all twigs less than half an inch in diameter. For larger limbs a sharp fine-tooth saw is needed. Make all cuts as smooth as possible and close to the main stem. When a large limb has to be removed, it may be advisable to cut twice, the first some inches out to avoid splitting, and the second to shorten the stub. A common mistake is the leaving of long stubs which cannot heal over before rot begins. Where it is necessary to remove large limbs, the wounds should be covered with grafting wax or thick lead paint to prevent the entrance of spores which cause decay.

### GRAFTING.

Grafting is the operation of inserting a scion into a stock, usually for the object of changing the variety of fruit produced. Trees bearing undesirable fruit may be top-grafted with some valuable variety. Many choice half-hardy varieties may be successfully grown by top-working on some hardy stock. Especially desirable characteristics in any variety may be perpetuated by grafting. Individu-



ality is quite as marked in plants as in animals. A certain tree may possess some desirable quality, and this may be preserved and perhaps improved upon by selection. It is advisable when cutting scions to select from those trees which have the desirable characteristics most strongly marked. Nurserymen, as a rule, do not pay sufficient attention to the source from which they secure their scions. The individual orchardist may greatly improve his plantation by top-grafting with scions from a tree having the desired qualities most strongly marked.

\*Grafting is usually performed in the spring. It is essential that the cambium layer of the scion and stock be in contact on at least one side. From this mucilaginous layer, lying between the wood and the bark, the new cells are formed which in time unite the parts and cover the wound. It is necessary to cover the wounds made in outdoor grafting to prevent the entrance of rot-producing spores. For this purpose wax is generally used.

A good grafting wax may be made by melting together four pounds resin, two pounds beeswax, and one pound tallow. Cool by pouring into a tub of water. Then work up into bars or balls which may be kept in any cool place until required. To economize wax, cloth is sometimes dipped into the hot wax, making wax-cloth. This is more difficult to use than pure wax. The wax may be melted and carried in a glue pot and applied with a brush, or, as is more commonly done, it may be kept in water warm enough to keep the wax pliable so it may be readily applied by hand. It is well to keep the hands greased to prevent the wax from adhering to the fingers.

There are two common methods of top-grafting: (1) Whip or tongue grafting, which is practised upon small branches and young trees; (2) Cleft grafting, which is usually performed on branches from one-half to two inches in diameter.

In whip grafting the stock is cut with a bevel about one inch long, and the scion cut to fit that bevel. Both bevels are cut into slightly and the tongue of one fitted into the notch of the other. The cambium layers must be in contact on at least one side. After the scion is set the wound should be covered with wax or similar substance to exclude the air.

Large trees should not be entirely changed over in one year. The first year select the main branches; the second year part of the remainder, and finish the third year. In this way much of the annoyance caused by the growth of water sprouts is avoided.

When cutting off large branches for cleft grafting it is wise to cut twice, making the first cut a few inches above the position chosen for the scion. Then cut off the stub at the desired point, and avoid the danger of tearing the bark. With a chisel or grafting iron split the branch just far enough to admit the scions. Too deep a split weakens the stock, and the scions will not be held sufficiently firm. It is well to avoid grafting two horizontal limbs, one directly above the other. The tendency of new growth is upward, and the growths from the lower one will interfere with the upper. In branches, other than those growing perfectly upright, the split should be made parallel to, rather than at right angles to the ground.

The scion should be made wedge-shaped, with bevel about one inch long, starting at each side just at the base of a bud. Make the scion three buds long, cutting off just above the third bud. It should be cut a little thicker on the side next to the bud, so that the stock may pinch tightly on that side to insure a close contact of the cambium layers.

Open the cleft with the wedge end of the grafting chisel and insert one or two scions, as may be thought necessary. Place the lower bud of the scion to the outside. Do not force the scion down, but open the cleft by enough leverage

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\* For more detailed information send for Bulletin 144, "Apple Culture."

on the chisel to admit the scion freely. Setting the scion with the top pointing slightly outward insures contact in at least one point. After setting the scions, cover all wounds with wax.

It is sometimes necessary to remove part of the water-sprouts, which usually start during the summer, to give the scions room for proper development. By the following spring the scions should have made sufficient growth to require all space in that part of the tree, and all other growth should be removed.

#### SUN SCALD.

Sun scald is an injury to trees which occurs most frequently in the northern districts. It is most serious on young trees, but may also affect the upper side of the large branches in older trees. It is caused by the action of the hot sun on the trunk and branches in the early spring. The first indication is an unhealthy appearance of the bark on the south and south-west sides of trunk and upper side of large branches, the affected parts soon turn brown, then black, and finally die.

In districts where sun scald is apt to occur, it is well to head the trees low and incline the stem slightly to the south-west. In this way the branches afford some shade to the trunk. Anything which will shade the trunk in early spring will prevent the injury. For this purpose the most convenient of the following materials may be used: cornstalks, birchbark, building paper, or a veneer of thin wood, such as is used in basket making. The large branches of old trees should receive natural protection from the small branches and twigs of the top. For this reason severe pruning of the top is not advisable in northern districts.

When trees are badly affected they usually die, but where the injury is slight, and is noticed soon after it occurs, treatment is practicable. Cut away the injured parts, and cover the wound with grafting wax or some material which will keep the wood from drying out. If the tree is healthy and vigorous, the annual growth spreading in from the sound parts soon repairs the injury.

#### PROTECTION FROM MICE.

During the past two or three years, mice have become a serious menace to young orchards. The rapid increase in numbers may be largely accounted for by the indiscriminate destruction of the farmer's best friends, the hawks, that feed largely on mice by day, and the owls, which take up the work by night. By carefully protecting the hawks and owls for a few years, their numbers will again increase, so that the equilibrium of nature may be restored. In the meantime something must be done to protect the trees against the rodents.

Mice seldom harbor in a green crop, and on clean fields they find no protection. They are found chiefly along the fence lines and in old meadows. As there is usually some shelter afforded the mice near orchards, it is advisable to guard against their depredations. In localities where the snow falls early and remains on the ground all winter, the simplest means of protecting the trees is to tramp the snow firmly about the base of each tree early in the winter. Where the ground is not continuously covered with snow during the winter, a mound of earth about the tree is sometimes all that is required to divert the runways of the mice. Building paper cut into strips which will reach about one foot high when tied about the trunk of the tree in autumn has been found to be both a cheap and an effective preventive.

Badly girdled trees usually die. When the part girdled is small and is covered before the wood dries out with grafting wax or other substance which will protect the inner tissues, the tree may be saved. If the girdled part extends entirely around the tree, it will be necessary to establish some connection between



the cambium above and below the injury. This may be done by bridge-grafting. For this purpose use long scions cut to a bevel on each end. Insert one end above and the other end below the girdle, making sure that the cut surfaces are in contact with the cambium layer. A sufficient number of these scions should be put in to convey the cambium from the top to the roots and all cut surfaces exposed should be covered with wax.

#### PICKING.

Apples should be carefully picked by hand, without breaking the skin or bruising the fruit in any way. Summer varieties for immediate home use or special local trade should be allowed to ripen on the tree; but if intended for distant markets or storage they should be picked when fully mature, but before they have commenced to mellow. Winter varieties should hang on the tree until they have reached full size and have taken on good color. Apples picked while still immature as a rule keep longer than if allowed to fully ripen on the tree, but they do not develop the full color nor the best quality. No sharp distinction can be made between green and mature, or between fully mature and over ripe fruit; one blends imperceptibly into the other. Experience teaches at what stage to harvest the crop, in order to secure the highest quality and best keeping properties in the fruit. Sometimes, with summer varieties, it is necessary to go over a tree twice, picking the most mature specimens first and leaving the remainder for a week or two in order that they may more perfectly develop. Round bottom baskets or pails should be used for picking, and it is better to have them lined with cloth to prevent bruising the fruit. Fruit should not be piled on the ground, but should be placed at once on the sorting table or be placed in boxes or barrels for removal to the packing house. The apple should be picked with the stem on but without breaking off the fruit spur, as is likely to occur if the fruit is picked too green. Spring waggons should be used to convey the fruit to and from the packing house.

When the trees have been properly pruned, the fruit may all be harvested from ladders. A short step ladder is convenient for the underside and low branches of the tree. For the upper branches light cedar ladders of suitable length will be found very convenient. Extension ladders have been praised very highly in the past, but as they are both awkward and cumbersome, practical growers are abandoning them. The practice of climbing through the tree to gather the fruit, and letting the baskets down to the ground by means of a rope, is out of date, and is not practised in commercial orchards. Inexperienced pickers often lose a great deal of time by not picking clean as they go, making it necessary to carry the ladder back and forth. Each time the ladder is moved all apples in reach should be picked.

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# DESCRIPTION OF VARIETIES

ALEXANDER. (*Emperor Alexander.*)



ORIGIN: introduced into England from Russia in 1817.

TREE: hardy, spreading, vigorous, productive; bears early.

FRUIT: very large size; form round, ovate, conical; skin greenish yellow, russet dots, streaked or splashed with red; stem  $\frac{3}{4}$  inch long, set in a deep cavity; calyx large, nearly closed, set in a deep, even, basin.

ALEXANDER.

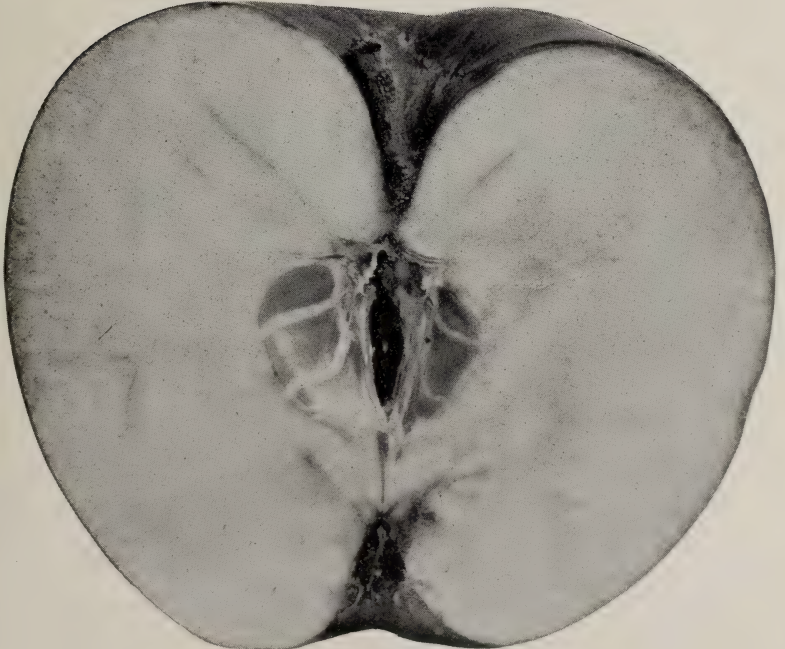
FLESH: yellowish white; crisp, not very fine, moderately juicy; flavor subacid, pleasant.

QUALITY: dessert, fair; cooking, good.

VALUE: home market, first class; can be successfully shipped to Great Britain in cold storage.

SEASON: September to November.

ADAPTATION: quite general, the tree being hardy.



SECTION OF ALEXANDER.



ASTRACHAN. (*Red Astrachan.*)

ASTRACHAN

ORIGIN: imported from Sweden to England in 1816, and widely planted in Southern Ontario for a summer market apple. Scarce another apple of its season equals it in beauty of appearance, for, in addition to its rich crimson color, it is often covered with pale white bloom. Selected fancy grades of this apple are usually in good demand in our home markets, but sometimes there is a surplus, and prices even for Astrachans are very low. Promising for export in cold storage.

TREE: upright; very vigorous; begins bearing early; very productive.

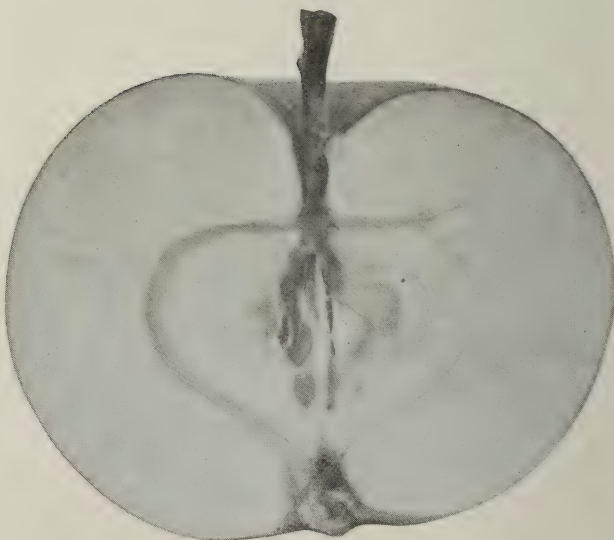
FRUIT: medium to large round, narrowing towards apex; skin, deep crimson when exposed to sun, yellowish green in shade, often covered with a thin, whitish bloom; stem, stout, three-quarter inch long, in a deep cavity; calyx closed in a shallow, somewhat irregular basin.

FLESH: white, crisp, juicy, tender, becoming mealy when over-ripe; acid, almost too tart to be counted very good for either dessert or cooking.

VALUE: first-class where an early summer apple is in demand.

SEASON: early to mid August.

ADAPTATION: In Niagara district perfectly hardy and productive. Not considered profitable in Lake Simcoe district by some growers.



SECTION OF ASTRACHAN.

## BALDWIN.

ORIGIN: The Baldwin originated in the State of Massachusetts and has been for many years the most popular winter apple for either home or foreign markets. The average

yield from full grown<sup>2</sup> trees each alternate year is about eight barrels per tree, and in some instances much larger. Large orchards of this variety have been planted in the apple growing counties of middle and southern Ontario, where for lack of other varieties to fertilize the blossoms, and owing to the prevalence of apple scab, they have proved unproductive.

TREE: not hardy outside the best fruit districts; upright, spreading, vigorous grower, usually very productive.



BALDWIN.

FRUIT: large, roundish, ovate; skin yellow, shaded and splashed with crimson and red, spotted with some russet dots; stem heavy, three-quarters of an inch long, in a broad cavity; calyx closed, in a deep plaited basin.

FLESH: yellowish white; tender, juicy; flavor subacid, sprightly, aromatic.

QUALITY: dessert fair; cooking good.

VALUE: market first class, especially for export.

SEASON: November to March.

ADAPTATION: adapted only to the best apple districts, where it is one of the most profitable varieties.



SECTION OF BALDWIN.



A fine large red apple, which brings a high price in the British market if grown free from fungous spots, to which, unfortunately, it is somewhat subject.

ORIGIN: with Mr. Larue, near Brockville, Leeds Co., Ontario, but introduced by Mr. Baxter.

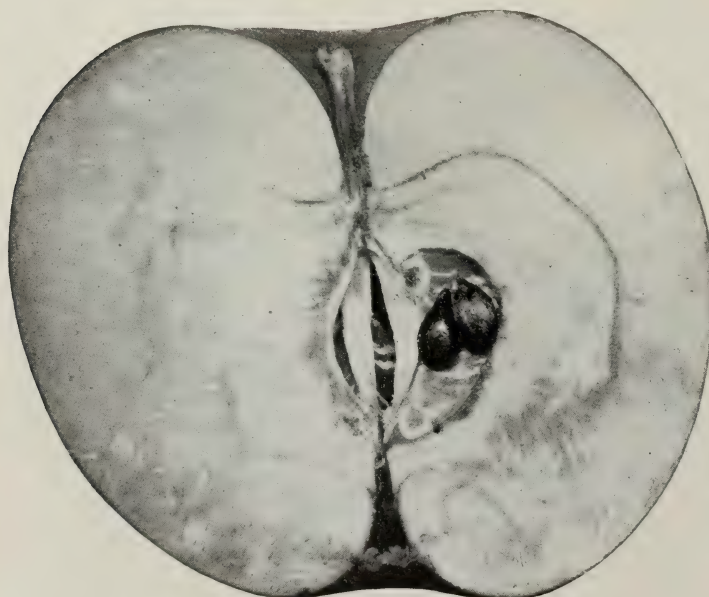
TREE: healthy, vigorous, hardy, moderately productive.

FRUIT: size large, to very large; form roundish, slightly conical; color red with obscure stripings of dark red, and numerous prominent grey dots; stem half an inch long, in a narrow, funnel form cavity, calyx nearly closed, in a large regular basin.

BAXTER (*Larue.*)



BAXTER.



SECTION OF BAXTER.

FLESH: white, often streaked with red; texture moderately firm, not very juicy; flavor slightly acid.

QUALITY: dessert medium; cooking good.

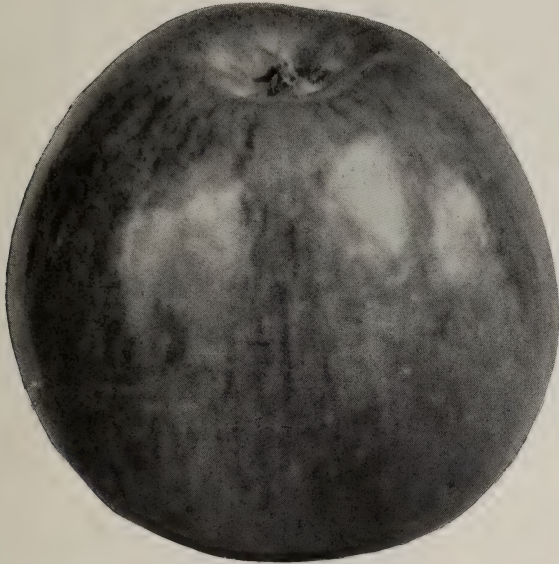
VALUE: home and foreign market, first class.

SEASON: October to January.

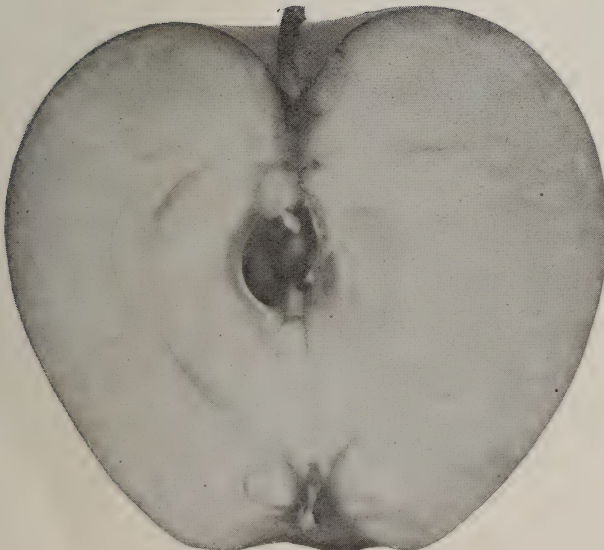
ADAPTATION: has proved hardy and profitable in Eastern Ontario and the Lake Simcoe District.

## BEN DAVIS.

One of the most popular market apples in the southwestern and western states because of its great productiveness, hardiness, good color and its keeping and shipping qualities. Highly valued by some growers in Canada, but condemned by others on account of its inferior quality.



BEN DAVIS.



SECTION OF BEN DAVIS.

**ORIGIN :** brought from North Carolina to Kentucky with a lot of other seedling apples by Mr. Ben Davis. Scions taken from Kentucky to Southern Illinois about 1820.

**TREE :** spreading, fairly vigorous and very productive.

**FRUIT :** medium to large roundish, truncated conical, unequal ; color yellow, striped and splashed with red, having scattered aureole dots; stem slender, one to one and a half inches long in a deep cavity ; calyx erect, partly closed in a deep, wide basin.

**FLESH :** dull, white, mild, subacid.

**QUALITY :** dessert, poor; cooking, fairly good.

**VALUE :** home market, second class ; foreign market, first-class.

**SEASON :** January to May.



## BLENHEIM.

*(Blenheim Orange, Blenheim Pippin.)*

An apple that is constantly gaining in favor with both grower and consumer, because of its size, its beauty, its evenness of form and general excellence for cooking and dessert purposes. It is grown in the counties of Prince Edward, Victoria, Lincoln and elsewhere, and is highly valued as a commercial apple. It certainly deserves to be more generally planted.

ORIGIN: a garden in Woodstock, England, near the residence of the Duke of Marlboro'; shown at a meeting of the London Horticultural

Society in 1819, and introduced into France into 1840.

TREE: very vigorous in habit and consequently a scant bearer while young, but a regular and abundant bearer as it grows older; dwarfed on the Paradise stock, the tree becomes an early bearer.

FRUIT: large to very large on favorable soil; form roundish oblate, slightly smaller at the apex than at the base, very regular; color yellowish, splashed with dull red on sunny side and streaked and with deep red dots small and distinct; stem short, three-quarters of an inch long, stout in a large russeted cavity: calyx large and very open, with short segments placed in a large green cavity.

FLESH: cream white fine, crisp, moderately juicy, flavor sweet, spicy, slightly acid.

QUALITY: dessert good; cooking very good.

VALUE: home and foreign markets, first class. **BLENHEIM.**

SEASON: November to February.

ADAPTATION: best apple districts only.



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BENONI.

A summer apple little grown in Ontario, and not highly esteemed for commercial purposes.

ORIGIN : Massachusetts.

TREE : spreading, fairly vigorous ; hardy ; fairly productive.

FRUIT : size scarcely medium ; form oblate conical ; skin rich yellow, blushed with red in the sun with a few scattered bright dots : stem half an inch long in a deep cavity ; calyx erect, partly closed in a deep basin.

FLESH : color yellow ; texture tender and juicy ; flavor rich subacid.

QUALITY : dessert very good ; cooking good.

VALUE : market second class.

SEASON : August to September.

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BIETIGHEIMER.

A fall apple of magnificent appearance, attaining a very large size.

ORIGIN : Germany.

TREE : habit vigorous, spreading ; an abundant biennial bearer ; hardy.

FRUIT : size very large, sometimes immense ; form round, oblate ; skin whitish yellow almost covered with pale red, and having a few obscure stripes and splashes, and numerous whitish dots ; stem very short, in a wide, regular shallow cavity ; calyx closed in a narrow slightly corrugated basin.

FLESH : white ; texture firm, juicy ; flavor brisk, subacid.

QUALITY : poor for dessert ; fair for cooking.

VALUE : home and foreign market second class.

SEASON : September.

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BLUE PEARMAIN.

A variety found in many of the older orchards ; not productive enough to be profitable.

TREE : strong, vigorous, healthy ; a light bearer.

FRUIT : size, very large ; roundish, regular, slightly conical ; color, splashes and stripes of dark purplish red over a dull yellow ground, solid red in sun, with heavy white bloom and distinct white, russet dots ; stem three-quarters of an inch long, set in a wide, deep cavity ; calyx open in a smooth, shallow basin.

FLESH : color yellowish ; texture firm, moderately juicy ; flavor mild acid, rich, aromatic.

QUALITY : first rate.

VALUE : not profitable on account of unproductiveness.

SEASON : November to February.

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BOGDANOFF.

A promising apple for the north ; not recommended where Spy and Baldwin succeed.

ORIGIN : Russia.

TREE : growth vigorous ; habit upright.

FRUIT : size medium ; form roundish, somewhat ribbed ; color green or yellowish green often with faint bronze blush and numerous small white dots ; stem short, set in a shallow cavity ; calyx set in a broad, deep plaited basin.

FLESH : color white ; texture tender and juicy ; flavor pleasant, subacid.

QUALITY : dessert fair ; cooking good.

VALUE : market second class.

SEASON : November to February.



## BOIKEN.

Tested at our Simcoe station since 1896 and esteemed worthy as a commercial apple.

ORIGIN : tree imported from Russia by Prof. Budd ; named after Dike-Warden Boike of Germany.

TREE : a fair grower ; habit willowy, like Golden Russet ; an early and abundant bearer.

FRUIT : size medium : form oblate conical ; skin smooth, yellow with red cheek and many minute white dots ; stem long in a wide, deep cavity ; calyx in a wide, wrinkled basin of moderate depth.

FLESH : color white ; texture firm, juicy, fine grained ; flavor sprightly, refreshing, subacid.

QUALITY : dessert fair ; very good for cooking.

VALUE : thought well of at Lake Simcoe Station for market.

SEASON : November to February.

## BOTTLE GREENING.

An apple grown in some parts of Ontario for home uses, for which its excellent quality makes it very desirable ; it is not recommended for the commercial orchard, because the fruit is rather tender for shipment to distant markets.

ORIGIN : according to Chas. Downing this variety was found near the border line between Vermont and New York State, and takes its name from a hollow in the original tree, where workmen were accustomed to keeping their bottle.

TREE : vigorous, productive.

FRUIT : medium to large ; form oblate, slightly conical ; color yellowish with bright red on one side, a thin bloom and a few light dots ; stem half an inch long in a deep, funnel-form cavity ; calyx nearly closed, in a moderately deep, slightly plaited basin.

FLESH : greenish white ; texture fine, tender, juicy, almost melting ; flavor subacid.

QUALITY : dessert, very good.

VALUE : home market, first class ; foreign market, second class.

SEASON : November to February.

BROCKVILLE (*Brockville Beauty*).

A seeding of Fameuse which is as yet grown only to a limited extent in the eastern part of the Province. This fruit is inclined to run small as the trees overload.

ORIGIN : near Brockville, Ontario.

TREE : hardy, moderately vigorous ; bears heavily every alternate year.

FRUIT : form conical ; size medium to small ; skin white, almost covered with bright red.

FLESH : color white ; texture crisp, tender, breaking : flavor brisk acid.

QUALITY : dessert and cooking good.

SEASON : late August to mid September.

### CABASHEA. (*Twenty Ounce Pippin.*)

Not worth planting in Ontario. Through confusing its name with that of Cayuga Red Streak, often called Twenty Ounce, this apple has been widely planted in our Province. The tree is unproductive and the fruit, although large and fine in appearance, drops early and is poor in quality.

ORIGIN: unknown.

TREE: vigorous, spreading, unproductive.

FRUIT: large, roundish oblate, slightly conical; skin yellowish green, shaded dull red on the sunny side; stem five-eighth of an inch long, stout, in a wide cavity of moderate depth; calyx open in a wide shallow basin; core medium.

FLESH: white, firm, coarse, subacid, only fair for cooking, useless for dessert.

VALUE: tested twenty years at Maplehurst, Grimsby, and found unprofitable on account of unproductiveness.

SEASON: October to December.

### CANADA RED. (*Red Canada of Beach.*)

ORIGIN: unknown; Beach says it was brought from the neighborhood of Toronto, into Western New York State.

TREE: a strong grower, productive in some places, while a shy bearer in others, and hence is not recommended.

FRUIT: medium to large, roundish conical; skin yellow, well splashed and washed with deep, rather dull red; dots fairly numerous, large, yellow, prominent; cavity deep, narrow; stem short, slender; basin narrow, shallow, slightly wrinkled; calyx small, partly open.

FLESH: yellowish, tender, moderately juicy, mildly subacid with a pleasant but not high flavor; core of medium size.

QUALITY: good.

SEASON: mid to late winter.

### CAYUGA. (*Cayuga Red Streak, Twenty Ounce.*)

A large, fine looking cooking apple for late autumn: a good market sort; grown in limited quantities in Ontario.

ORIGIN: Connecticut.

TREE: vigorous; compact; productive; an annual bearer; on large trees, growth is straggling.

FRUIT: very large, roundish, uneven; skin greenish yellow to yellowish white, with marblings and stripes of red and crimson, and a few large grey dots; stem three quarters of an inch long, in a deep, slightly russeted cavity; calyx small, half open in a smooth shallow basin.

FLESH: yellowish white, texture coarse grained, tender, moderately juicy; flavor brisk, subacid, pleasant.

QUALITY: dessert poor, cooking good.

VALUE: market first-class.

SEASON: late autumn to early winter.

### COLVERT.

A fairly good fall market apple, being large in size and rather attractive in appearance, but of fair quality only. It has been widely planted in Ontario for market. For kitchen use it is much inferior to the Gravenstein.

ORIGIN: uncertain.

TREE: very vigorous and very productive.

FRUIT: large, form oblate, slightly conical; skin greenish yellow, with cheek and faint stripes of dull red; stem stout, half an inch in length.

FLESH: color greenish white; texture tender, moderately juicy; flavor subacid, ordinary.

QUALITY: dessert, fair; cooking, good.

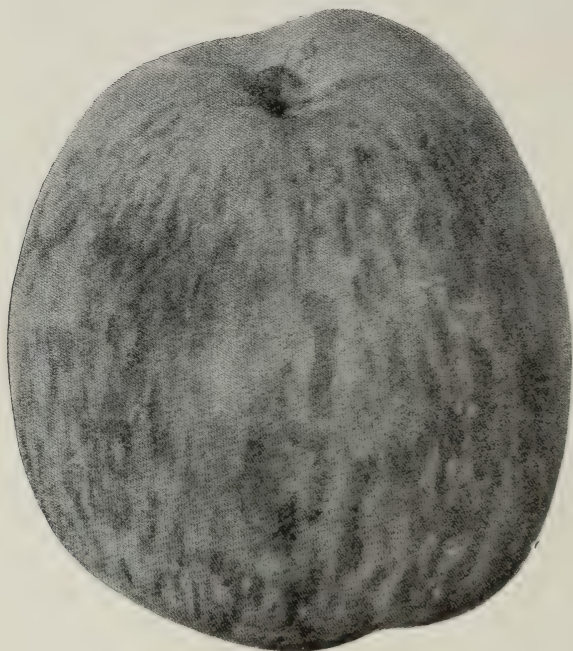
VALUE: second-class for market.

SEASON: October to November.

ADAPTATION: succeeds at Georgian Bay and Bay of Quinte stations, and is widely grown in the older apple sections of Ontario.



## CHARLAMOFF.

*(Pointed Pipka, Arabka).*

CHARLAMOFF (after S. B. Green).

One of the best hardy varieties of its season which has been successfully grown at our Algoma station. It is classed by the Minnesota State Horticultural Society as one of four varieties having the first degree of hardness.

ORIGIN: Russia; imported by Budd and Gibb.

TREE: very hardy; habit spreading; growth vigorous; very productive.

FRUIT: size above medium; form oblong, truncated, angular, ribbed;

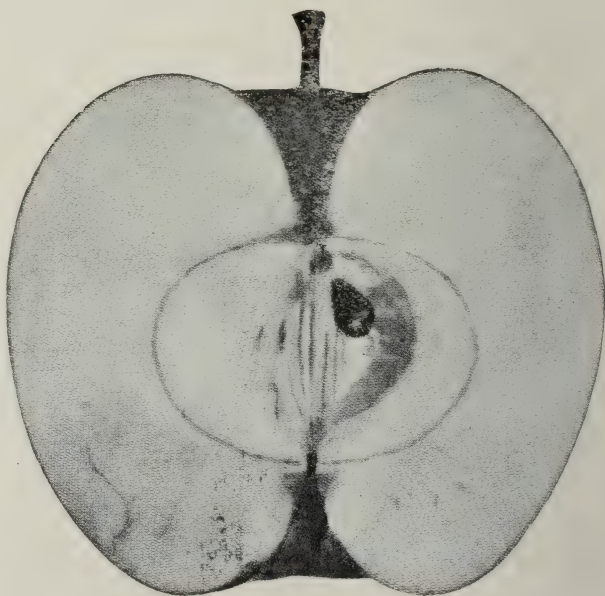
skin light yellow, covered with dark crimson stripes and splashes, with red cheek and white, minute dots; stem medium stout, in a deep, acute, russeted cavity; calyx open, sometimes closed, in a wide, shallow, wrinkled basin.

FLESH: color white, stained with red under the skin; texture somewhat coarse, juicy; flavor subacid, pleasant.

QUALITY: dessert good.

VALUE: market second class, being very perishable.

SEASON: August, just before Duchess.



SECTION OF CHARLAMOFF,

## CRANBERRY PIPPIN.

An apple worthy of being planted in southern Ontario as a fancy variety for export; although the quality is ordinary and not suitable for dessert, its extreme beauty when opened in mid-winter, its large and even size, and the productiveness of the tree every alternate year, make it a desirable variety.

Sometimes, however, this variety is subject to warts and knots which mar its beauty.

ORIGIN: accidental, on a farm, near Hudson N. Y.

TREE: very vigorous, healthy, spreading, and productive.



CRANBERRY PIPPIN.

FRUIT: medium to large, roundish, oblate; skin smooth, yellow shaded and striped with two shades of red; stem slender, one-eighth of an inch long in a deep cavity; calyx closed, in a wide, wrinkled basin.

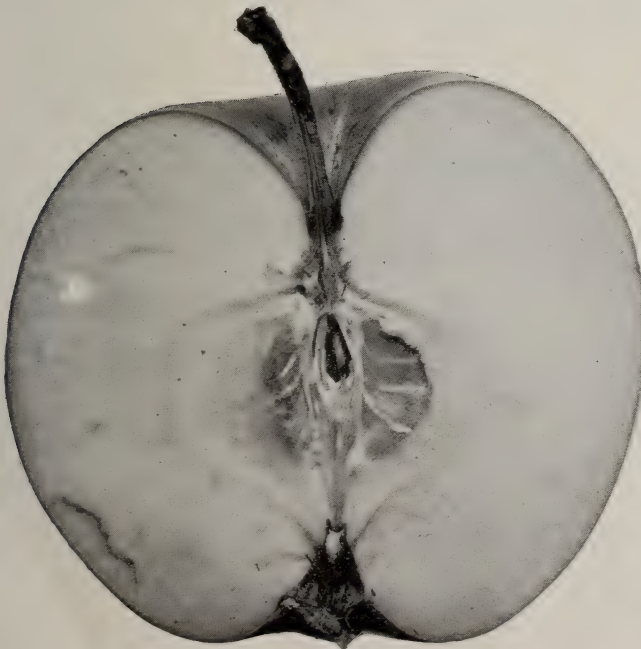
FLESH: color white; texture firm, crisp, coarse, moderately juicy; flavor subacid.

QUALITY: dessert, poor, cooking fair.

VALUE: market second class.

SEASON: November to February.

ADAPTATION: southern portions of the Province, especially along the shores of the lakes.



SECTION OF CRANBERRY PIPPIN.



## DUCHESS.

(Oldenburg of Downing, Borovitsky of Royal Horticultural Society, 1824.)

In cold storage, this apple may be profitably exported to Great Britain. It succeeds in every part of Ontario where the apple can be grown, and its beauty always brings for it the top price in the market.

ORIGIN : Taurida Gardens, St. Petersburg, Russia, in 1824 ; introduced into England by the Royal Horticultural Society in 1824.

TREE : very hardy, very vigorous and an early and abundant bearer.

FRUIT : medium to large ; form regular, roundish oblate, one sided ; skin greenish yellow,



DUCHESS



SECTION OF DUCHESS

with bright red stripes, splashes and numerous russet dots ; stalk slender, three-quarters of an inch long, set in a deep funnel-shaped cavity ; calyx long, closed, in a deep broad plaited basin.

FLESH : greenish, turning yellowish white at maturity ; texture fine, firm and juicy ; flavor brisk, refreshing acid.

QUALITY : dessert fair, cooking good.

VALUE : first class of its season for home market.

SEASON : August and September.

ADAPTATION : general. Succeeds fairly well wherever apples are grown in the Province, and does exceptionally well on the borders of Lakes Ontario and Erie.

## EARLY HARVEST.

The best apple of its season for dessert, but of late years rendered worthless in Ontario by scab, which not only spoils its appearance, but lessens its size and injures its flavor. The Early Harvest and Fall Pippin are the two apples which seem to be least able to resist this terrible fungus, and which most favor its spread. Unless, therefore, the fungus is checked by spraying with the Bordeaux mixture, this apple must be left out of the list of desirable varieties.

ORIGIN : United States, in cultivation since about 1700, A.D.

TREE : only medium in vigor, never attaining a large size, old trees averaging from one-half to two-thirds the size of Greening trees of the same age ; upright and spreading ; productive, considering the size of the tree and the fruit ; yield of full grown trees averages about four barrels every alternate year.

FRUIT : medium round, oblate ; skin smooth, bright straw color when ripe, with a few faint dots ; stem short, one-half to three-quarters of an inch, in a medium cavity, often russeted ; calyx closed in a shallow, sometimes slightly plaited basin.

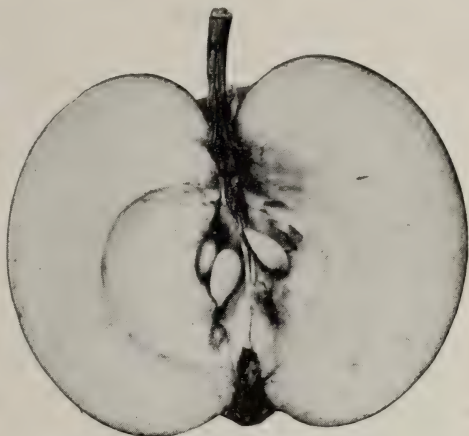
FLESH : white, fine grained, juicy, crisp, tender ; flavor rich, sprightly, pleasant subacid.

SEASON : late July to early August.

QUALITY : dessert best; cooking good.

VALUE : home market first class ; foreign market second class.

ADAPTATION : succeeds in the best apple districts, but is much subject to scab.

FILLBASKET. (*Kentish Fillbasket.*)

An old English variety of great beauty of appearance and enormous size, often exceeding four inches in diameter. It is not, however, much grown in the commercial orchards of Ontario, being a fall apple, ill adapted to export, unless by cold storage, and of very ordinary quality.

ORIGIN : England.

TREE : vigorous, fairly productive, semi-hardy.

FRUIT : very large, globular, slightly ribbed ; color smooth, shiny, light green or pale yellow, sometimes almost white, and on sunny side splashed and striped with bright red ; stem stout, short,  $\frac{1}{2}$  inch long, set in a large cavity ; calyx closed, set in a large plaited basin.

FLESH : fine grained, tender and juicy ; flavor mild, subacid.

QUALITY : poor for dessert, good for cooking.

VALUE : home market second class ; foreign market third class.

SEASON : October to December.

ADAPTATION : North shore Lakes Ontario and Erie, east shore Lake Huron.



## FALLAWATER.



FALLAWATER

form round, regular, smooth; color pea green, shaded on sunny side with brownish red cheek, dots sparse, large light green; stem half an inch long, stout, set in a narrow, moderately deep cavity; calyx small, nearly closed, set in a shallow wrinkled basin.

FLESH: greenish white; texture fine-grained, firm, moderately juicy; flavor mild subacid, fair.

QUALITY: fair for cooking.

VALUE: home and foreign market first class.

SEASON: January to March.

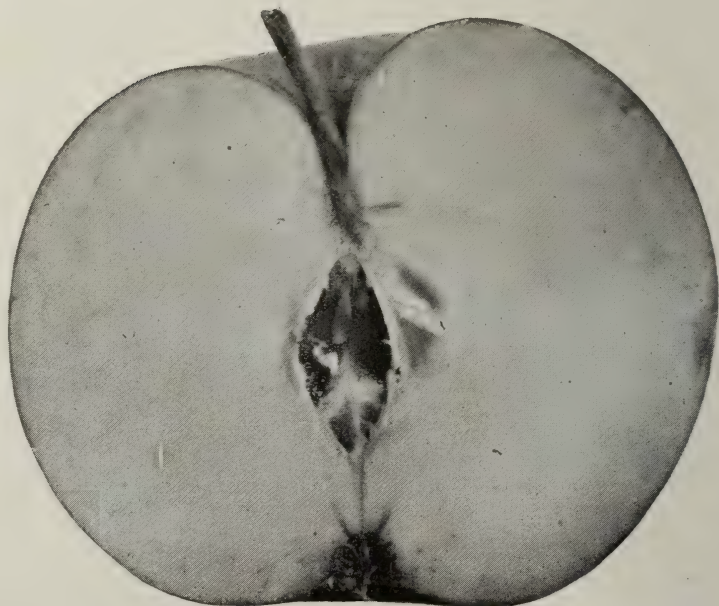
ADAPTATION: successfully grown at our Bay of Quinte station and all parts of the Province farther south; also in the Lake Huron district, but in same localities it is said to be short-lived.

A large apple, of even size and fine appearance, which is grown for market quite extensively in Pennsylvania, Ohio, and in some of the Western States, and to some extent in Ontario. Were it more uniformly productive, we could recommend it as a profitable commercial variety.

ORIGIN: Pennsylvania.

TREE: a vigorous grower; fairly productive.

FRUIT: size large to very large;



SECTION OF FALLAWATER

## FALL PIPPIN.



A general favorite as a fall cooking apple, and possessing a fairly good flavor as a dessert apple. It was at one time planted very freely, but of late years it has been discarded because of its liability to the apple scab.

ORIGIN : America, probably from seed of Holland Pippin.

TREE : habit stout, vigorous, spreading; head round; long lived, some trees in Niagara district are now over 100 years of age; fairly productive.

FRUIT : large; form roundish, sometimes obscurely ribbed; skin yellow, often with red cheek and a few small grey dots; stalk half to three quarters of an inch long, set in a small, moderately deep

## FALL PIPPIN.

cavity; calyx small, open in a small, moderately deep basin.

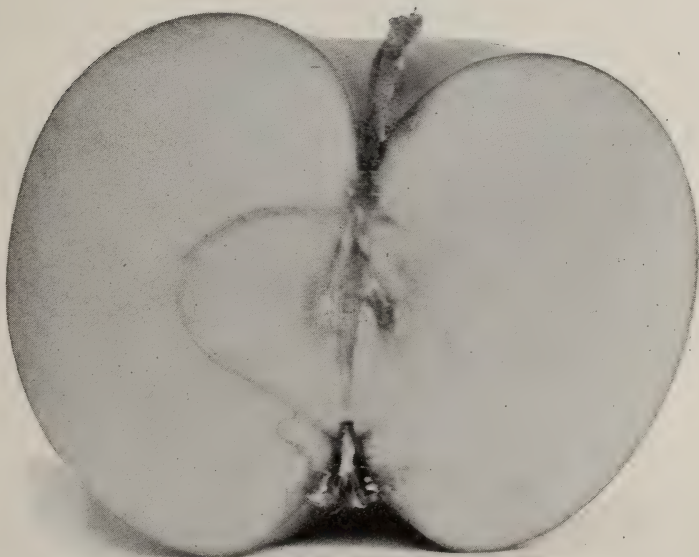
FLESH : greenish white; texture tender, mellow, and fairly juicy; flavor brisk, pleasant, aromatic.

QUALITY : dessert fair; cooking best.

VALUE : home market first class, foreign market second class.

SEASON : November and December.

ADAPTATION : hardy in the best apple districts, but very subject to scab.



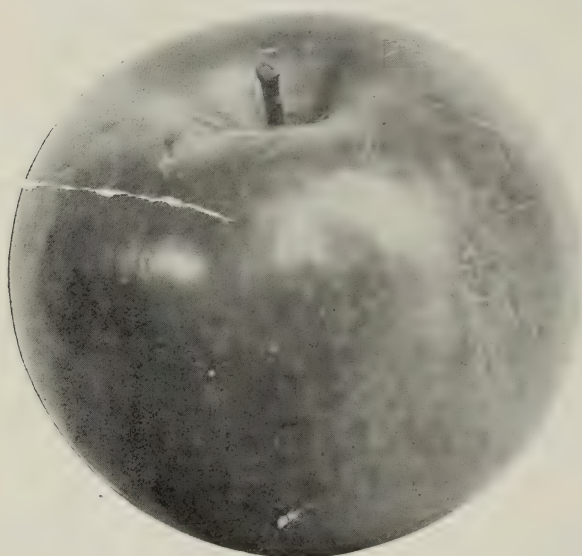
SECTION OF FALL PIPPIN.



## FAMEUSE.

(*Snow, Pomme de Neige*).

The most highly valued of all table apples, and but for one fault the Fameuse would be the most profitable of all, especially in Eastern Ontario, where it attains its highest perfection. The fault is that it is quite subject to the apple scab, so that in some places the fruit is entirely worthless.



FAMEUSE.

ORIGIN : Province of Quebec, probably from seeds brought from France ; it is often called Snow, from the color of its flesh, and its proper name signifies a famous apple.

TREE : moderately vigorous ; moderately productive ; hardy.

FRUIT : medium size, roundish ; skin, light green, striped and shaded with two shades of red, often nearly covered with deep red ; stalk slender, half an inch long, in a small deep cavity, calyx small, segments often recurved, set in a shallow, slightly plaited basin.

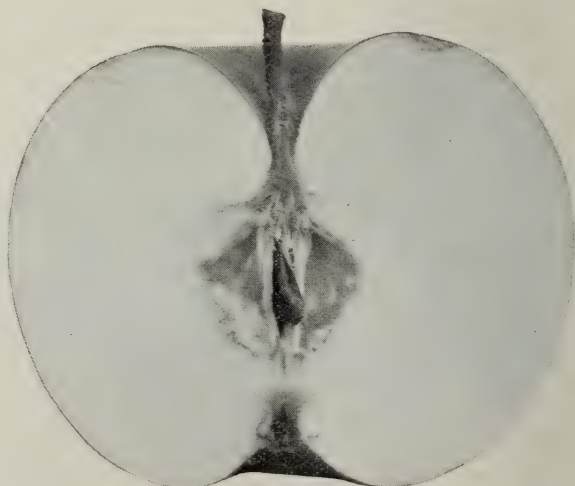
FLESH : snow white ; texture tender, very fine grained, breaking, juicy ; flavor, aromatic.

QUALITY : dessert first-class ; cooking fair.

VALUE : first class for all markets, when perfect in form and free from spots.

SEASON : October to December,

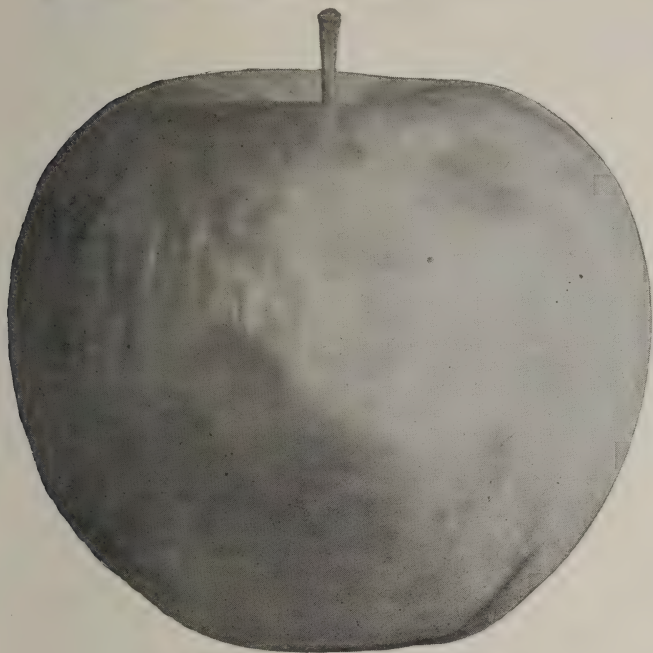
ADAPTATION : general, but specially adapted to eastern portion of the Province.



SECTION OF FAMEUSE.

## GIDEON.

A very pretty apple, but inclined to rot at the core: it is less highly colored than Duchess. These faults will prevent its being popular as an export apple.



GIDEON.

ORIGIN : by Peter M. Gideon, Excelsior, Minn., U.S. ; of same parentage as Wealthy.

TREE : vigorous, hardy, holds fruit well, productive.

FRUIT : large, round or slightly conical ; skin white, with bright red cheek shaded with deeper red splashes ; dots white, obscure ; cavity broad, deep, regular or slightly corrugated ; stem one inch long, slender ; calyx half closed, in a small, corrugated basin.

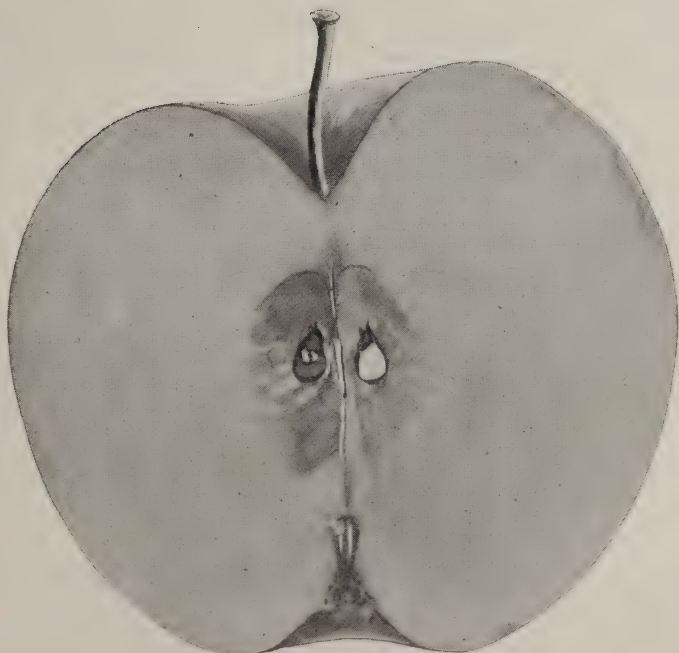
FLESH : white, flaky, tender, almost melting, yet crisp, fine, juicy, and of good flavor.

QUALITY : dessert, poor ; cooking, fair.

VALUE : home market second class ; foreign third class.

SEASON : September to November ; October at Ottawa.

ADAPTATION : only valuable in the north.



SECTION OF GIDEON.



## GOLDEN RUSSET.



GOLDEN RUSSET.

This is the Golden Russet of Western New York. (It is sometimes incorrectly called American Golden Russet, which is a tender fleshed apple only keeping until January). This apple is very valuable in the colder sections of the Ontario apple belt, the tree being comparatively hardy, and the fruit of high commercial value; in the warmer sections it is considerably grown in the older orchards, but not much planted of late years, because it is only of medium size, tedious to harvest, and inclined to drop early.

**TREE** : fairly vigorous, shoots slender, or willowy, speckled; habit irregular; only fairly productive.

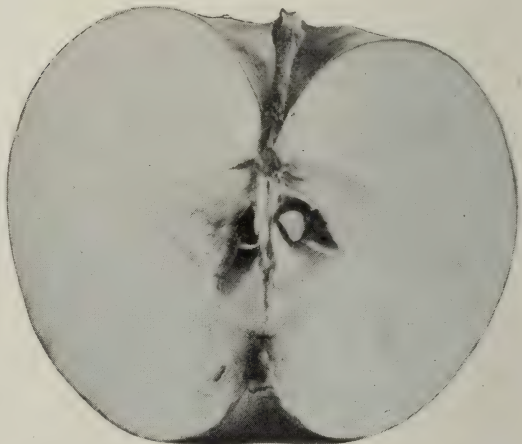
**FRUIT** : size medium; form roundish, slightly oblong, slightly flattened; skin covered with thick russet, occasionally showing a patch of greenish yellow; stem slender, half an inch to one inch long; not subject to scab.

**FLESH** : color yellowish, texture fine grained, firm, crisp; flavor aromatic, subacid.

**QUALITY** : dessert fair; cooking good.

**VALUE** : export first class.

**SEASON** : keeps till May in cold cellar, but is inclined to shrivel if the air is dry and warm.



SECTION OF GOLDEN RUSSET.

## GRAVENSTEIN.



SECTION OF GRAVENSTEIN.

A favorite commercial apple in Nova Scotia, but altogether too little cultivated in Ontario, considering its many excellent characteristics. It has no competitor in its season for either home use or market.

ORIGIN: according to Hogg, the original tree grew in the garden of the Duke of Augustenberg, at the Castle of Graufenstein in Schleswig-Holstein in Germany, and was still standing about the year 1850. Leroy inclines to accept a statement by Hirschfeld, a German pomologist, who in 1788 wrote the first description of the apple, and stated that it was brought to Germany from Italy. The earliest trace of this apple we can find, dates

back to about 1760. It is now widely grown in Western Europe, and is a favorite everywhere.

TREE: much more vigorous in growth than ordinary varieties, and when in bloom remarkably beautiful with its extraordinary sized pure white blossoms; hardy and productive.

FRUIT: large to very large; form oblate conical, somewhat one-sided and more or less pentagonal; skin greenish yellow to orange, beautifully striped and splashed with two shades of red; stem stout, about half an inch in length, set in a deep, narrow cavity; calyx partially closed, wide long segments set in a wide irregular, slightly russet basin.

FLESH: white; texture crisp and very juicy; flavor rich, vinous and aromatic.

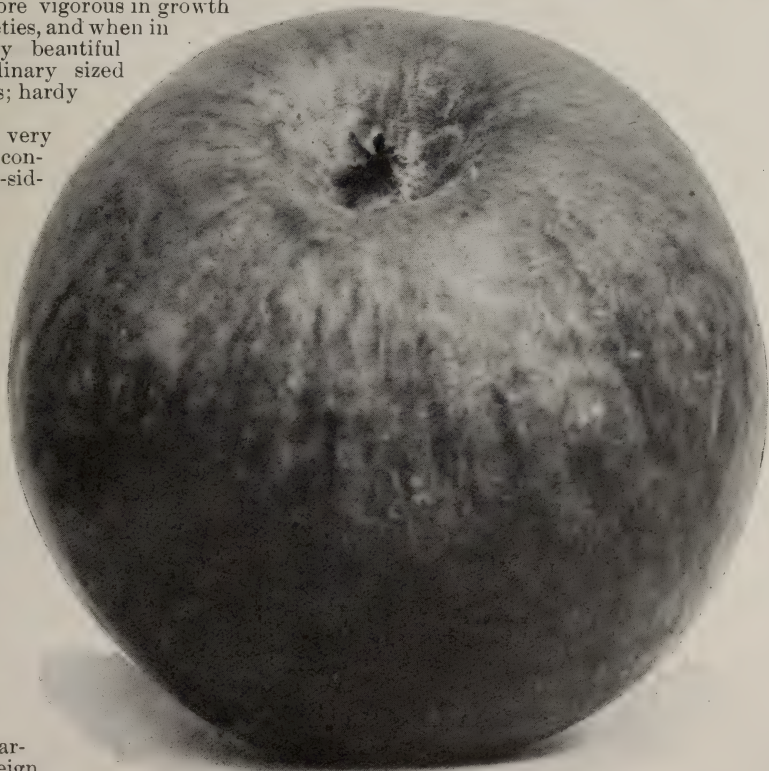
QUALITY: dessert, very good; cooking, good.

VALUE: home market, first class; foreign market, first class.

SEASON: September and October.

GRAVENSTEIN.

ADAPTATION: general in the best apple sections.





GREENING. (*Rhode Island Greening*).

One of the staple varieties for profit in Ontario orchards. No one variety, except the Baldwin, was more widely planted in our Province previous to 1875, but since that time it has been liable to scab some seasons, especially in cases where proper spraying is neglected. Its color is against it in foreign markets, and yet, as it becomes known, the demand for it increases. It has a tendency to drop early, especially south of Lake Ontario, and, therefore, needs to be gathered in good season, about the first of October, as a rule. Remarkable instances of productiveness have been reported. One large tree at Maplehurst, Grimsby, nearly one hundred years planted, yielded twenty barrels one season, and fifteen barrels another.

ORIGIN : Rhode Island.

TREE : very vigorous, spreading, a crooked grower ; fairly hardy ; very productive ; succeeds well on a great variety of soils.

FRUIT : large, roundish, sometimes a little flattened, regular, unless overgrown : color green, becoming lighter as it ripens, often showing a blush when well exposed to the sun ; dots light grey, aureole, numerous toward the apex ; stem seven-eighths of an inch long in a smooth, narrow cavity ; calyx partly closed in a nearly smooth shallow basin.

FLESH : white, with a greenish tint, yellowing as it matures ; texture fine grained, crisp, juicy ; flavor rich, slightly aromatic, pleasant, subacid.

QUALITY : dessert, medium ; cooking, best.

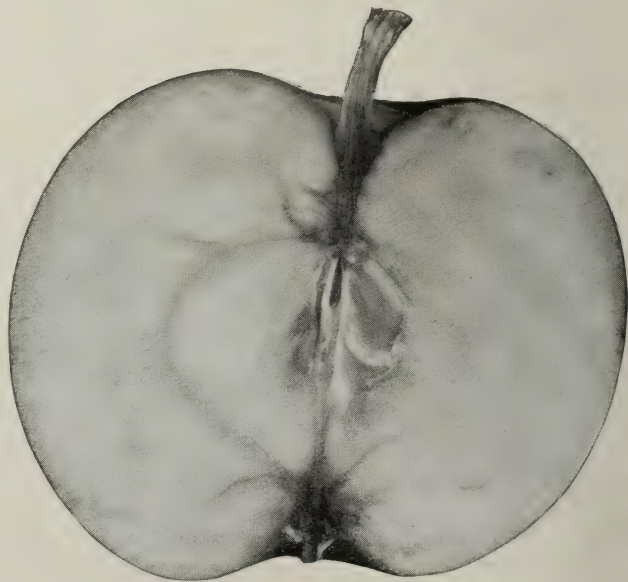
VALUE : home and foreign markets, first class.

SEASON : December to February.

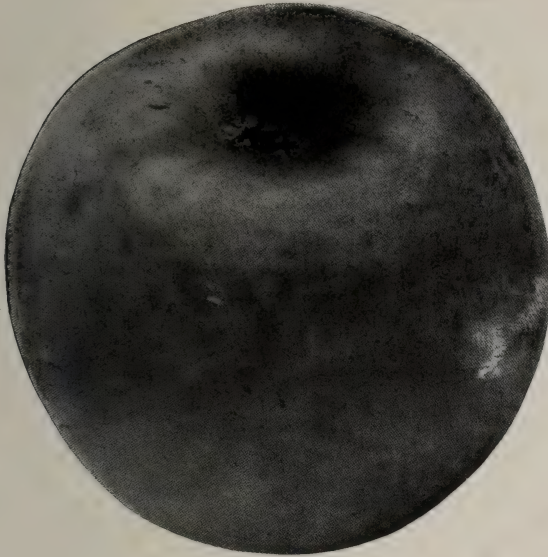
ADAPTATION : succeeds in the best apple districts.



GREENING.



SECTION OF GREENING.

GRIMES. (*Grimes Golden Pippin*.)

GRIMES.

An apple that has a good reputation in some parts as a winter dessert apple, on account of its excellent quality and its rich golden color; not planted extensively in the commercial orchards of Ontario.

ORIGIN : Virginia; on the farm of Thomas Grimes.

TREE : vigorous, branches with knobs at base; not hardy very far beyond north shore of Lake Ontario; a regular, annual bearer.

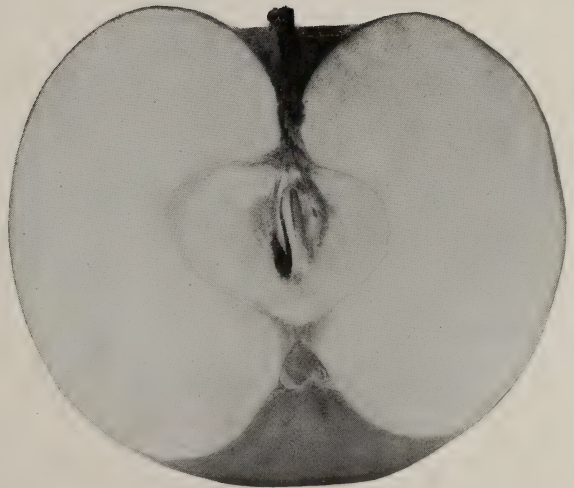
FRUIT : size medium; form roundish oblong; color rich golden yellow with russet dots; stem slender in a deep cavity; calyx partly closed in a deep, wrinkled, abrupt basin.

FLESH : yellow; texture firm, crisp, juicy; flavor rich, aromatic, spicy, subacid.

QUALITY : dessert best; cooking poor.

VALUE : market, second class.

SEASON : December to January.



SECTION OF GRIMES.



GRINDSTONE. (*American Pippin.*)

Valuable chiefly for its long keeping, and for cider.

ORIGIN : United States.

TREE : hardy, vigorous, productive.

FRUIT : size medium ; form regular, roundish oblate ; skin dull green with patches and stripes of dull red and numerous dots ; stem short, stout in a deep, slightly russeted cavity ; calyx large, open, in a deep, medium sized, slightly wrinkled basin.

FLESH : color yellowish white ; texture firm, crisp, not very juicy, flavor brisk acid.

QUALITY : second rate for cooking ; third rate for dessert.

VALUE : second class for market purposes.

SEASON : March to June.

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HAAS. (*Fall Queen.*)

An old variety which was at one time popular in the colder parts of the Ontario apple belt because of the hardness of the tree, but which has now given place to the Wealthy.

ORIGIN : St. Louis, Missouri.

TREE : vigorous ; habit upright ; an early and an annual bearer, hardy.

FRUIT : size medium ; form oblate conical ; skin thick ; color yellow, marbled, splashed and striped with crimson, with a few obscure white dots ; stem short set in a broad cavity of moderate depth, slightly russeted ; calyx half closed in an irregular, wrinkled basin.

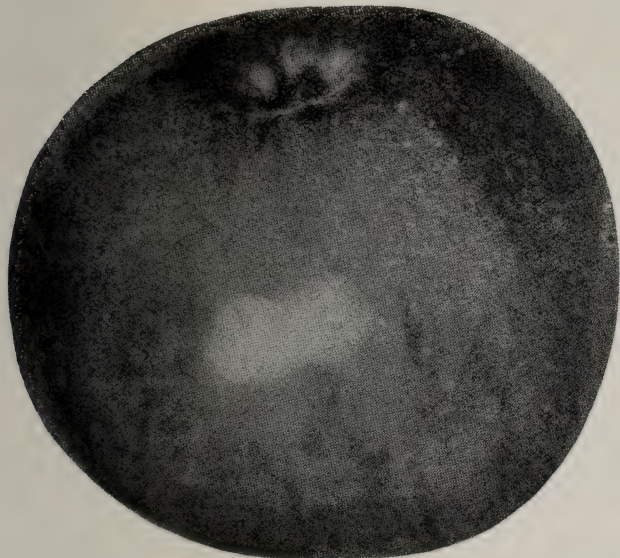
FLESH : white, often stained with red next the skin ; texture peculiar, quince like, juicy ; flavor subacid, slightly astringent.

QUALITY : dessert poor ; cooking fair.

VALUE : market second class.

SEASON : late autumn.

## HIBERNAL.



HIBERNAL. (After S. B. Green).

An attractive looking cooking apple, valuable also for hardness of tree ; one of the best of the Russian apples for our colder districts.

ORIGIN : Russia.

TREE : vigorous, of strong spreading habit ; healthy ; productive.

FRUIT : size large ; form roundish oblate conical ; skin yellowish, striped and splashed with red, with small white dots ; stem medium length set in a moderately deep regular cavity with large patch of russet ; calyx half open in a narrow shallow wrinkled cavity.

FLESH : color yellowish ; texture, tender, crisp, juicy ; flavor astringent acid.

QUALITY : dessert poor ; cooking good.

VALUE : home market in the north, first class.

SEASON : September to November.



SECTION OF HIBERNAL.



HUBBARDSTON. (*Hubbardston's Nonsuch.*)

HUBBARDSTON.

rich yellow ground nearly covered with stripes and splashes of light rich red; stem three-quarters of an inch long, set in a narrow deep russeted cavity; calyx open in ribbed basin.

**FLESH :** texture tender and juicy; flavor subacid, rich, sweet and excellent.

**QUALITY :** very good.

**VALUE :** market first class.

**SEASON :** October to February.

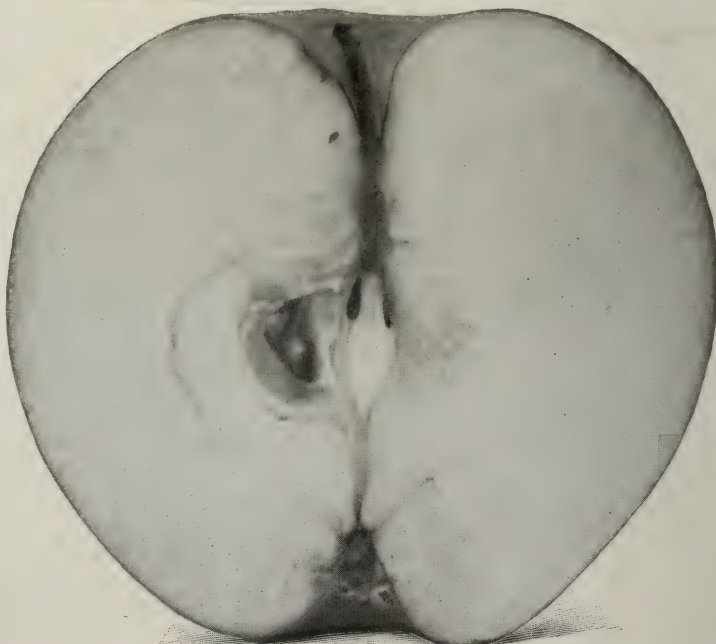
**ADAPTATION :** reported successful in the Counties of Simcoe, Prince Edward and Norfolk, but succeeds in all the best apple districts.

A first-class commercial apple for early winter. It succeeds well in the Province of Ontario, and deserves to be planted much more freely.

**ORIGIN :**  
Hubbardston,  
Mass.

**TREE :** hardy, vigorous, but somewhat subject to apple canker and therefore better top worked on some healthy grower; very productive; an early bearer.

**FRUIT :** size, medium to large; form round ovate, fairly regular; skin,



SECTION OF HUBBARDSTON.

## HYSLOP.

A well known and widely cultivated variety of hybrid crab. Its dark, rich, red color and its late season make it a valuable variety.

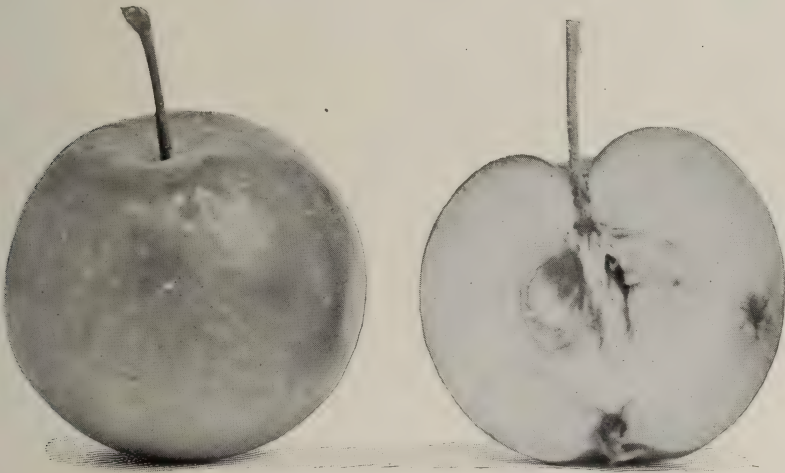
TREE : vigorous, of spreading habit.

FRUIT : size medium ; form roundish ovate, obscurely angular ; color a dark rich red, covered with heavy blue bloom, and having many obscure yellowish dots ; stem about one inch and an eighth in length, set in an obtuse, regular cavity.

FLESH : yellowish, acid.

VALUE : very good for culinary uses and for cider.

SEASON : September and October.



HYSLOP.

## JONATHAN.

A first class winter dessert apple, of the Spitzenburg type, valuable for the home garden but too small to be planted for market ; succeeds well in some locations.

ORIGIN : Woodstock, New York State.

TREE : of moderate vigor ; shoots slender, drooping ; should be top worked on a vigorous trunk ; inclined to be self sterile, and needs to be planted with other varieties for proper pollination.

FRUIT : size medium, in some localities small ; form longish, truncated conical, regular ; skin colored dark brilliant red in sun, and striped, splashed with lighter red, with numerous small whitish dots ; stem long slender set in a deep acute cavity ; calyx small, closed, in a wide, deep, abrupt basin.

FLESH : color white ; texture tender and juicy ; flavor subacid, spicy, aromatic, excellent.

QUALITY : dessert best ; cooking good.

VALUE : special markets first class ; export second class.

SEASON : November to February.



KING. (*King of Tompkins' County.*)

Said to have originated in New Jersey. On account of its excellent quality for cooking, its peculiarly rich aromatic flavor, its beautiful appearance and large size, this apple is taking the highest place in the great apple markets of the world. Unfortunately the tree is a poor bearer, and consequently unprofitable as an orchard variety, unless under exceptional circumstances. Top-grafted on Tolman Sweet, it is said to be more productive. For home use it is excelled by no apple.



TREE: a vigorous grower, of spreading habit, but not long-lived.

FRUIT: large, roundish, uneven; skin yellowish, shading off from red to dark crimson; stem short and stout, inserted in a wide, deep, somewhat irregular cavity; calyx closed in a broad, shallow, slightly corrugated basin.

FLESH: yellowish white, crisp and juicy, moderately firm; flavor rich, agreeable, aromatic.

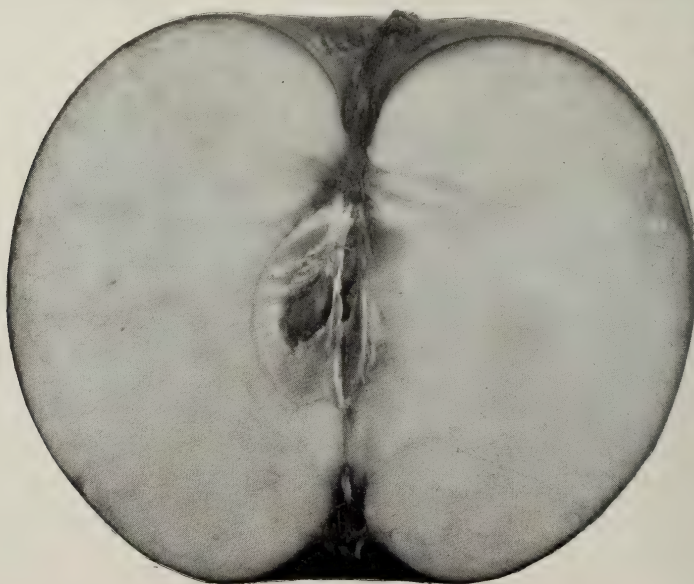
QUALITY: Dessert and cooking, very good.

## KING.

VALUE: home market first class; export first class.

SEASON: October to February in Southern Ontario; reported at the Simcoe station October to March for Northern Ontario.

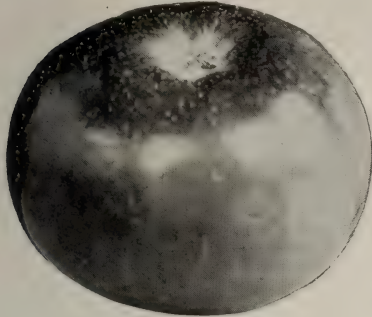
ADAPTATION: not hardy at Simcoe station unless top grafted on Tolman Sweet, or some



SECTION OF KING.

other hardy stock, and, therefore, it is not recommended for general planting in northern sections.

## LADY.



LADY.

A beautiful little apple for the amateur's collection, and very highly valued where known for a dessert apple, having a pleasant flavor and great beauty. In Europe the apple is known as *Api*, but in America it has become known as the Lady apple. Some say it was so called because from its small size and beautiful color, it seemed just suited to a lady's mouth.

ORIGIN : France.

TREE : upright habit and bears fruit in clusters, vigorous only fairly hardy and productive.

FRUIT : very small, flat oblate. Color green, turning to yellow, half covered with a rich red cheek, and many tiny dots which are more numerous towards the apex. Stem slender, half an inch long, set in a deep regular cavity. Calyx closed in a small wrinkled basin.

FLESH : greenish white ; texture fine grained, crisp and juicy ; flavor pleasant.

QUALITY : dessert, best ; cooking too small to be of any value.

SEASON : December to May.

ADAPTATION : successfully grown as far north as the Bay of Quinte station.



SECTION OF LADY.

## LA VICTOIRE.

This variety has not, so far, proved very productive, but is a handsome apple, and on account of its season and hardiness will probably prove useful in the north.

ORIGIN : near Grenville, Què. Probably a seeding of *Fameuse*.

TREE : hardy and a strong moderately spreading grower.

FRUIT : above medium size, oblate, regular ; skin greenish yellow, almost covered with crimson ; dots fairly numerous, gray, distinct ; cavity of medium depth and width, slightly russeted ; stem short and stout ; basin of medium depth and width, almost smooth ; calyx open and medium in size.

FLESH : white, tinged with red, rather coarse, moderately juicy, mildly subacid, with a pleasant flavor ; core small.

QUALITY : good.

SEASON : Midwinter. (*Macoun*).



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LIVLAND RASPBERRY (*Lowland Raspberry*).

A handsome hardy summer apple of very good dessert quality, one of the best summer apples for home use, but drops rather badly and ripens unevenly.

ORIGIN : Russia.

TREE : moderately upright, vigorous, moderately productive.

FRUIT : medium to large, roundish to oblate, conic, angular, color pale yellow, more or less marked, splashed and washed with bright red with a few pale yellow indistinct dots ; stem short to medium, moderately stout in a narrow cavity of medium depth ; basin shallow, narrow, slightly wrinkled.

FLESH : white tinged with red, crisp, tender, juicy, subacid with a good flavor.

QUALITY : dessert very good.

SEASON : middle to last of August.

ADAPTATION : quite hardy, having been fruited in Southern Manitoba. (*Macoun*).

---

LOUISE. (*Princess Louise, Woolverton*.)

An apple of great value for the home garden as a choice dessert variety, but probably not sufficiently productive to be profitable in the commercial orchard.

ORIGIN : at Maplehurst, near Grimsby ; a chance seedling of the Snow and first known as Woolverton. Samples were first exhibited by Mr. L. Woolverton at a meeting of the Ontario Fruit Growers' Association at Hamilton, where it was given the name Princess Louise, after Her Royal Highness, wife of the then Governor-General, His Excellency the Marquis of Lorne.

TREE : of slender habit ; fairly vigorous ; hardy ; moderately productive.

FRUIT : roundish, size medium ; skin greenish yellow, of bright waxy lustre, with cheek of clear bright carmine ; stem stout, three quarters of an inch long, in a narrow, moderately deep cavity ; calyx half open, in a broad, shallow, slightly plaited basin.

FLESH : pure white ; texture tender, fine, somewhat crisp, juicy with rich aromatic flavor.

QUALITY : dessert best ; cooking fair.

VALUE : home market, first class.

SEASON : November to February.

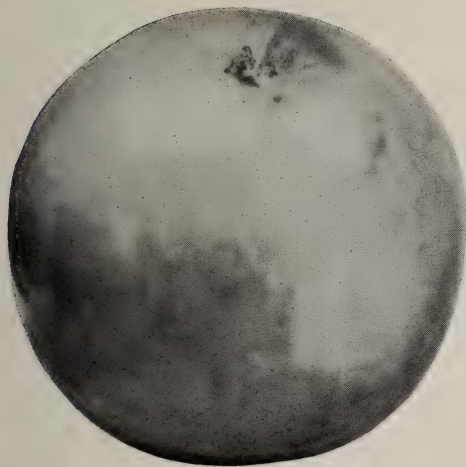
## LONGFIELD.

A late fall variety, valued chiefly for its hardiness ; too small to be profitable where better kinds will succeed.

ORIGIN ; Russia.

TREE : a poor straggling grower ; very hardy ; very productive, inclined to overbear and requires thinning ; an early bearer.

FRUIT : size small ; form roundish conical ; skin yellow, with bright red cheek, and a few large yellowish dots ; smooth ; tender, showing bruises quickly ; stem short, set in a deep regular cavity ; calyx half open in an abrupt, wrinkled basin.



LONGFIELD.



SECTION OF LONGFIELD.

FLESH : very white ; texture very tender, juicy ; flavor pleasant, subacid.

QUALITY : dessert fair ; cooking good.

VALUE : market third class.

SEASON : October and November.



McINTOSH. (*McIntosh Red*).

A very fine dessert apple for early winter use. "At Ottawa and along the St. Lawrence and other places where conditions are favorable, it is counted one of the best dessert apples of its season, adapted and profitable for export, but in the Niagara District it is not so much grown, owing to scab.

ORIGIN: with John McIntosh, Dundela, Ont., in whose orchard the original tree is still standing (1904).

TREE: hardy, vigorous; fairly upright; fairly productive; an annual bearer; of Fameuse type; inclined to drop its fruit last of September in Niagara District.



McINTOSH RED.

FRUIT: size medium to large; form roundish; color, deep crimson in sun, light crimson on shady side, inclined to show broken stripes and yellow dots, often with a heavy blue bloom; stem one inch in length, stout, set in a wide, and often somewhat irregular cavity, which is green at bottom; calyx closed in a smooth, regular, rather shallow basin. Cuts given on this page show fruit considerably reduced in size..



SECTION OF McINTOSH RED.

FLESH: snow white; texture crisp, tender, very juicy; flavor slightly subacid, aromatic, perfumed near the skin.

QUALITY: dessert first class.

VALUE: home market first class.

SEASON: November to January; quite ready for eating by November first.

ADAPTATION: Northern apple districts; succeeds at Trenton and St. Lawrence stations.

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McMAHON. (*McMahon White*).

A good sized and rather attractive fall apple, valuable especially for the hardiness of the tree; succeeds well at the Central Experimental Farm, Ottawa; too tender in flesh to ship well.

ORIGIN: from seed of Alexander, planted about 1860 by A. L. Hatch, Ithaca, Wisconsin.

TREE: very hardy; very strong grower; productive.

FRUIT: size large, uniform; form roundish oblate, slightly conical, obscurely ribbed; skin light yellow, becoming white at full maturity, often with blush of red and large white dots; stem short, about half an inch long, stout, in an acute, deep, russeted cavity; calyx half open in a narrow, moderately deep, slightly wrinkled basin.

FLESH: color white; texture coarse grained, tender, juicy; flavor subacid.

QUALITY: dessert fair; cooking very good.

VALUE: home market first class; export third class.

SEASON: October to December.

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MAIDEN BLUSH.

A valuable apple for the amateur because of its extreme beauty, but not considered a very profitable market variety by Ontario fruit growers.

ORIGIN: New Jersey.

TREE: moderately vigorous grower, and fairly productive.

FRUIT: size medium to large; form oblate, very regular, but slightly one-sided; color lemon yellow with beautiful crimson blush; stem three quarters of an inch long, set in a moderately deep, wide cavity; calyx closed, in a shallow, slightly wrinkled basin.

FLESH: color white; texture fine, tender; flavor pleasant; subacid.

QUALITY: dessert, fair; cooking, good.

SEASON: September and October.



## MARTHA

A hybrid crab.

ORIGIN: by Peter M. Gideon, Excelsior, Minnesota.

FRUIT: large, oblate, very regular; surface smooth, yellow, almost entirely covered with a beautiful bright red, with a bluish bloom, no stripes or splashes; dots white, conspicuous; cavity wide, regular; stem long; basin very wide, nearly flat; segments often nearly obsolete core closed.



SECTION OF MARTHA.



MARTHA.

FLESH: yellowish white, acid; good for culinary use.

SEASON: early to mid September.

## MANN.

The Mann apple is not very highly recommended for extended orchard planting in Ontario, because of its rather unattractive green color, in shipping season. The tree has the merit of being a productive variety and an early bearer, but the fruit is inclined to drop early, and to be small, when not thinned.

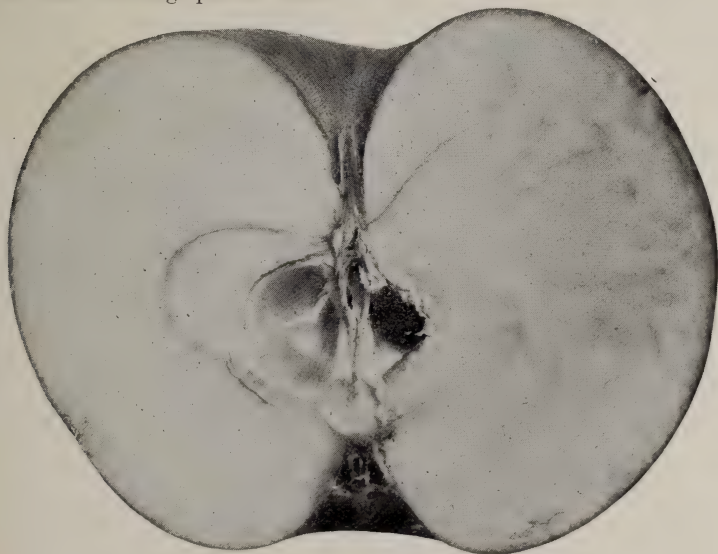
ORIGIN : New York State, a chance seedling introduced by Dr. Mann, after whom it was named by the Western New York Horticultural Society.

TREE : a hardy, moderately vigorous, spreading, with slender branches ; an early and regular bearer, inclined to overload.

FRUIT : of large size when thinned and well cultivated, form roundish, oblate, regular ; skin dull green, yellowing at matur-

ity, nearly covered with light green dots ; stalk half an inch long in a large slightly russeted cavity ; calyx closed in a large plaited basin.

MANN.



SECTION OF MANN.

FLESH : yellowish, moderately firm, juicy, agreeable, subacid.

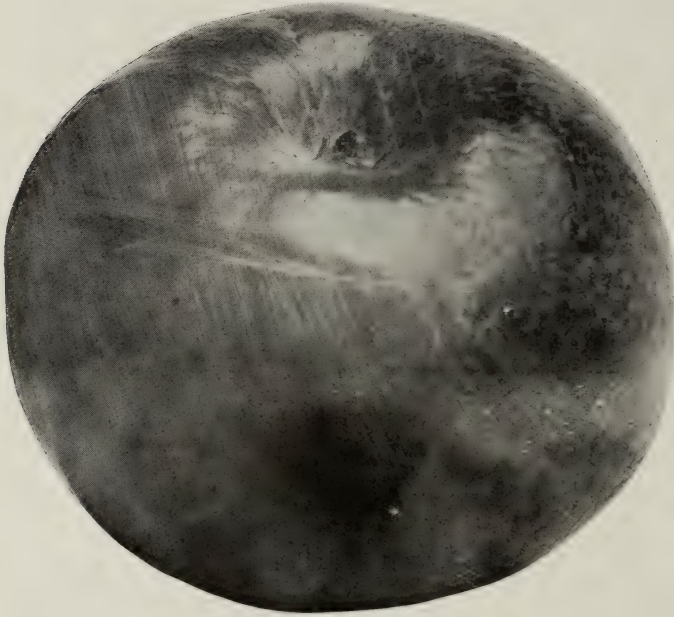
QUALITY : dessert poor ; cooking good.

VALUE : first class for home or foreign market, but the best prices are not always obtained for the fruit, owing to its unattractive color.

SEASON : January to April.



## MILWAUKEE.



MILWAUKEE.

One of the best hardy winter apples for the commercial orchards in the northern belt of apple culture in Ontario; tested several years at our St. Lawrence station, and reported as one of the most promising winter apples for profit yet tested for that district; a fairly good shipper.

ORIGIN: a seedling of Duchess, by Geo. Jeffrey, Milwaukee, Wisconsin.

TREE: growth moderately vigorous; habit spreading; very hardy; very productive; an early bearer; foliage dark green, abundant; shows characteristics of the Duchess.

FRUIT: large, form oblate, flattened, slightly angular; skin yellowish green blushed and streaked with bright red and crimson on the sunny side; stem slender, one-half inch long in a large deep, often russeted cavity; calyx half closed in a wide deep wrinkled basin.

FLESH: color yellowish white; texture tender, crisp, juicy; flavor acid.

QUALITY: dessert fair; cooking very good.

VALUE: for near markets first class.

SEASON: December to March.



SECTION OF MILWAUKEE.

## NEWTOWN PIPPIN.

(*Green Newtown Pippin, Yellow Newton Pippin, Albermarle.*)

The highest priced apple that reaches the English market, but not much grown in Ontario because the fruit is subject to the apple scab.

ORIGIN : Newtown, Long Island.

TREE : a slow grower and only moderately hardy ; needs rich soil and good cultivation.

FRUIT : medium to large ; form, roundish oblique, with broad obscure ribs terminating in five crowns at the apex ; color, dull green, becoming yellowish during the winter, with reddish brown tinge on the sunny side, and dotted with small grey russety dots ; stalk, three-quarters of an inch long, inserted all its length in a deep, wide, funnel-shaped cavity ; calyx small closed in a small, moderately deep basin.

FLESH : greenish-white ; texture firm, crisp, juicy ; flavor, rich and highly aromatic.

VALUE : home markets, first class ; foreign market, first class.

QUALITY : cooking, first class ; dessert, first-class.

SEASON : January to May, at its best in March.

ADAPTATION : only to certain favored sections.

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NORTH STAR. (*Dudley Winter.*)

Originated in Maine. Fruit roundish ; size above medium to large ; cavity, open, deep, slightly russeted ; stem medium length, slender ; basin deep, medium width, slightly wrinkled ; calyx partly open ; color pale yellow ; streaked and splashed with, deep lively red ; dots few, small, pale yellow, indistinct ; skin moderately thick, tender ; flesh yellow, rather coarse, tender, moderately juicy ; core small ; subacid, pleasant flavor ; quality above medium, almost good ; season late September to early winter. Tree vigorous and productive. A handsome apple, about the same season as Wealthy. This variety is succeeding well in some of the colder parts of the country. (*Macoun.*)

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NORTHWESTERN GREENING.

One of the best winter commercial apples, especially for colder sections ; attractive in appearance.

ORIGIN : Wisconsin ; introduced in 1872 by E. W. Daniels.

TREE : productive, but long in coming into bearing ; hardy, in Minnesota reckoned to be of the second degree of hardness, or in the same class as the Wealthy.

FRUIT : size large to very large ; form roundish, slightly conical ; color green, becoming yellowish, with small white dots ; stem about half an inch long in a regular funnel-shaped cavity of moderate depth ; calyx closed, in a regular, very slightly wrinkled basin.

FLESH : color greenish white ; texture fine-grained, firm, juicy ; flavor sprightly, subacid, pleasant.

QUALITY : dessert, good ; cooking, good.

VALUE : home market first class.

SEASON : winter.



## ONTARIO.



ONTARIO.

**FRUIT:** large, oblate, slightly ribbed. sides unequal; skin yellowish, nearly covered with bright red, with a few scattered small white dots with bluish bloom; stem seven-eighths of an inch long, in a deep, russeted uneven cavity; calyx closed in a moderately deep, corrugated basin.

**FLESH:** white with green tint, yellowing slightly as it ripens; texture fine grained, tender, juicy; flavor mild, subacid, sprightly, aromatic.

**QUALITY:** very good for all purposes.

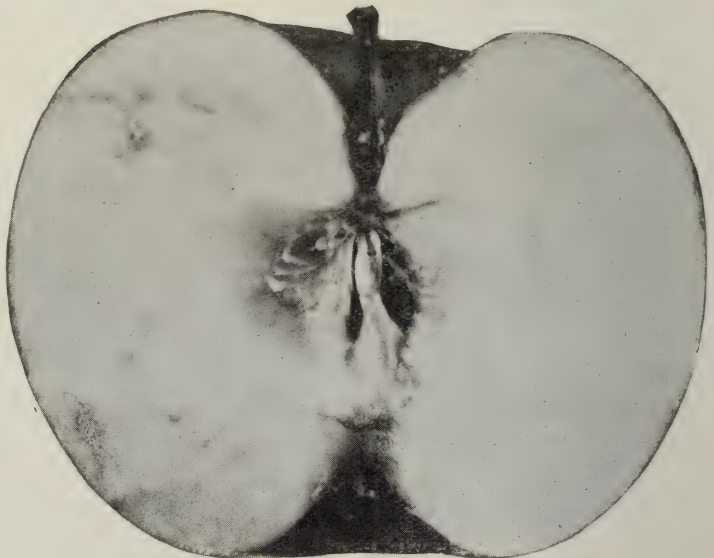
**SEASON:** November to April.

**ADAPTATION:** Southern Ontario to north shore of Lake Ontario and other good apple districts.

This is a native of Ontario, as its name indicates. It was originated by the late Charles Arnold of Paris, Ontario, by crossing Wagener and Spy. Its early and abundant bearing, the good quality and even size of the fruit, are points in its favor as an export variety. It has been tested in a commercial way for some years at our Bay of Quinte station, where it is counted profitable.

**ORIGIN:** Paris, Ontario.

**TREE:** fairly hardy, moderately vigorous, somewhat spreading; very productive; an early bearer.



SECTION OF ONTARIO.

## ORANGE.

A fairly good dessert variety of hybrid crab.

ORIGIN : United States.

TREE : a slow grower, productive.

FRUIT : size medium ; form round, slightly flattened at the ends ; color light orange, with minute white dots and russet veins ; stem slender, one and a quarter inches in length set in a deep open cavity ; calyx closed, in a furrowed basin.

FLESH : color yellowish, yellow veinings ; texture a little dry ; flavor mild, pleasant, acid

SEASON : September,

PATTEN. (*Patten Greening.*)

ORIGIN : Iowa.

TREE : hardy ; moderately vigorous ; very productive.

FRUIT : large oblate ; cavity deep, medium width, russeted ; stem short ; basin deep, medium width ; calyx open, large ; skin pale yellow with traces of pale green, with a pink blush ; dots moderately numerous, pale green, distinct ; bloom, slight ; skin, moderately thick.

FLESH : yellow, moderately juicy, tender, coarse : core, small ; subacid ; pleasant flavor

QUALITY : above medium.

SEASON : October to mid-November. Hardier than Wealthy and useful where that variety will not succeed. (*Macoun.*)

## PHOENIX.

A fairly profitable commercial apple in some parts. It is grown in Northumberland county and in other apple sections in the Province, and by some growers is ranked equal to the Baldwin for profit.

ORIGIN : Illinois.

TREE : healthy and productive.

FRUIT : medium to large ; roundish, sometimes quite one-sided ; color greenish yellow ground well covered with deep red, obscurely striped with a darker shade, and having a few small grey dots ; russeted about the cavity and green about the basin ; stem one half an inch long in a funnel shaped cavity ; calyx half closed.

FLESH : creamy-white, coarse grained, somewhat juicy ; flavor mild, acid, pleasant.

QUALITY : dessert, poor, cooking, good.

VALUE : first class for export, if shipped early.

SEASON : December to February.

## PORTER.

"Fruit above medium, oblong ovate, conical, regular, often ribbed at apex ; bright yellow, sometimes a dull blush in the sun ; stalk one inch long, slender, cavity rather small ; basin narrow ; flesh tender, rich, rather acid, of fine flavor. Fair and productive. Early autumn. (*American Fruit Culturist.*)



## PEWAUKEE.



PEWAUKEE.

A good commercial apple for the northern limits of the Ontario apple belt where Spy and Baldwin are tender ; but not as hardy as was at first supposed. It is not gaining in popularity.

ORIGIN : seed of Oldenburg crossed with Northern Spy, raised by G. P. Pepper, Pewaukee, Wisconsin.

TREE : hardy, but not equal in this respect to Wealthy ; vigorous ; habit-round topped with upright centre ; an annual bearer.

FRUIT : size large ; form roundish oblate, irregular, unequal ; color yellow striped and splashed with red ; dots whitish ; bloom grayish ;

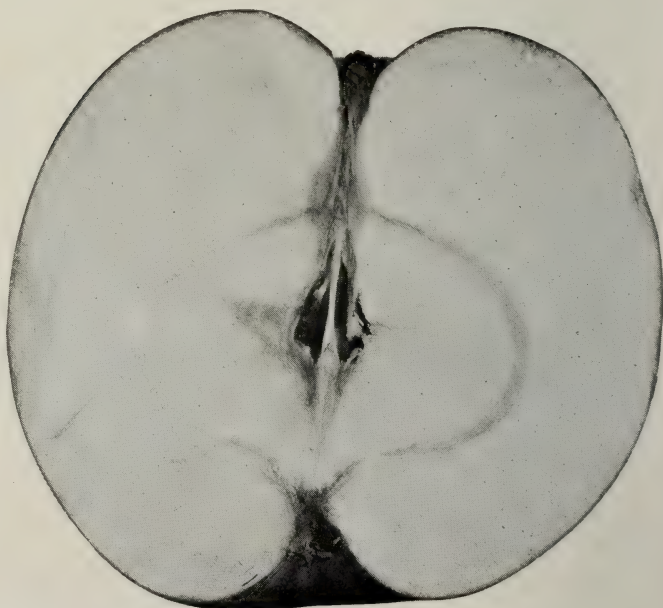
stem short, half an inch, sometimes fleshy at point of insertion, set in small shallow often flat cavity, sometimes lipped ; calyx half open, large, in a small shallow, corrugated basin.

FLESH : color yellowish ; white with yellow veinings ; texture firm, rather coarse, juicy ; flavor fair, subacid.

QUALITY : dessert fair ; cooking good.

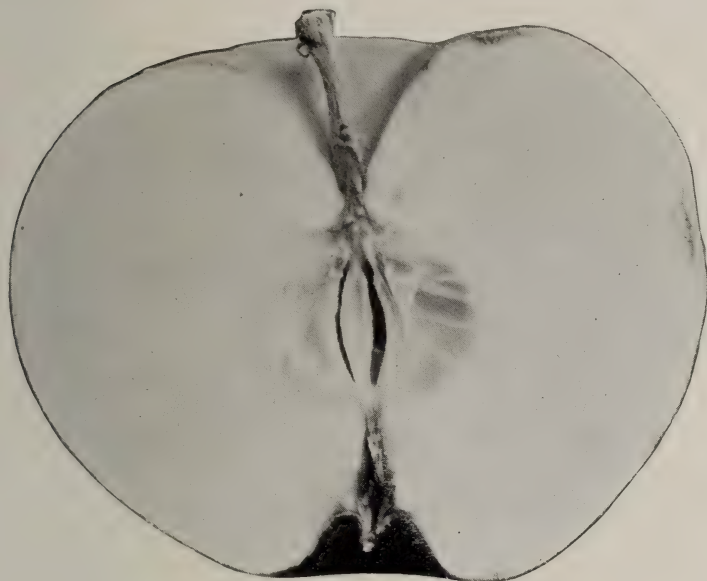
VALUE : home or foreign market first class.

SEASON : December to March.



SECTION OF PEWAUKEE.

## PRIMATE.



SECTION OF PRIMATE.

A fine dessert apple for the home garden; too tender for distant shipment.

ORIGIN: uncertain probably Western New York.

TREE: hardy, very vigorous, symmetrical, very productive.

FRUIT: medium to above medium; form oblate conical; skin light yellow, with crimson blush on sunny side; stem about one inch long inserted in a large deep furrowed cavity; Calyx closed in an abrupt, moderately deep, somewhat corrugated basin.

FLESH: color white; texture tender, juicy, with a very pleasant, subacid flavor.

QUALITY: dessert very good; cooking good.

VALUE: home market first class; foreign market second class.

SEASON: August and September.

ADAPTATION: succeeds in best apple districts.



PRIMATE.



RIBSTON (*Ribston Pippin*).

A highly esteemed English apple, largely planted in Ontario previous to 1860, but of late not so popular in commercial orchards.

ORIGIN : Ribston Hall, near Knaresborough, England.

TREE : moderately vigorous ; fairly healthy ; not hardy at the north ; very productive ; an early bearer.

FRUIT : size above medium ; form roundish, slightly conical ; skin rough ; color russet yellow with stripes of red and often a red shade on sunny side ; stem short set in a wide often somewhat russeted cavity ; calyx small, closed in a narrow angular, ribbed basin.

FLESH : yellow ; texture crisp, firm, granular, juicy ; flavor rich, aromatic, subacid.

QUALITY : dessert good ; cooking very good.

VALUE : home market first class.

SEASON : November and December ; keeps till January in a cool cellar.

ADAPTATION : succeeds in best apple districts, although it is somewhat hardier than Baldwin or Greening.

ROXBURY (*Boston Russet*, *Roxbury Russet*).

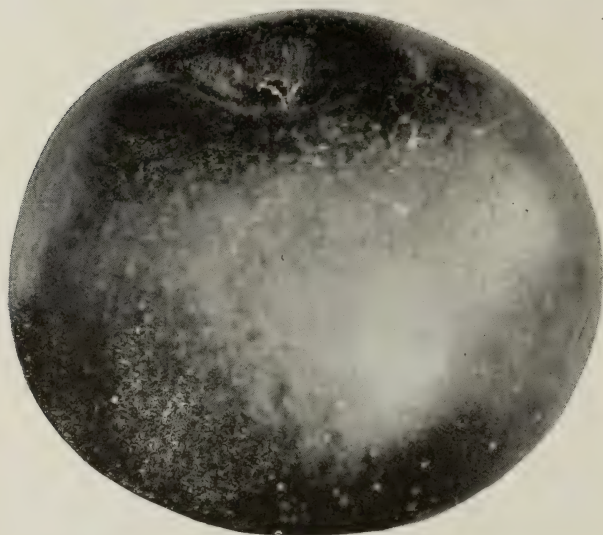
One of the staple export varieties in many parts of Southern Ontario, because of its long keeping qualities. It resists scab well, but is subject to the codling moth, unless well sprayed, and is inclined to drop early from the trees, resembling the Greening in this respect.

ORIGIN : Massachusetts.

TREE : fairly vigorous, spreading like Greening, but flatter in form of top.

FRUIT : medium to above medium, roundish, oblate, sides not equal ; skin tough, green, nearly covered with russet, and having a brownish red cheek when fully exposed to the sun ; stem half to three-quarters of an inch long in a medium sized, regular cavity ; calyx closed in a round medium sized basin. Cuts show fruit less than normal size.

FLESH : yellowish white ; texture almost coarse grained, moderately juicy ; flavor mild, subacid pleasant.



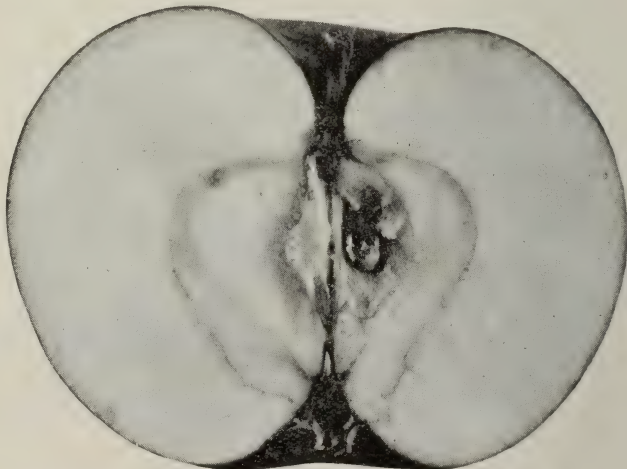
ROXBURY RUSSET.

QUALITY : dessert, fair ; cooking, good.

VALUE : home and foreign markets good.

SEASON : January to June.

ADAPTATION : long tested in the Niagara district and found to be well adapted to it. As hardy as the Greening, and succeeds in the best apple districts.



SECTION OF ROXBURY RUSSET.

## ST. LAWRENCE.

The St. Lawrence apple is not now planted in the commercial orchards of Ontario, bordering on Lakes Ontario, Erie or Huron, being inferior to other autumn varieties of its season, but it is valued in orchards along the St. Lawrence river, and in parts of the province between latitudes 45 and 46. It is rather subject to scab and codling moth.

ORIGIN : Montreal, Canada.

TREE : hardy, vigorous and productive.

FRUIT : large ; form,

roundish oblate ; color of skin yellowish, with distinct stripes and splashes of carmine ; dots obscure ; stem five-eighths of an inch long, inserted in a large, deep, regular cavity ; calyx closed in a small deep basin.

FLESH : color white, slightly stained ; texture crisp, tender, juicy ; flavor vinous, slightly acid.

QUALITY : dessert good ; cooking good.

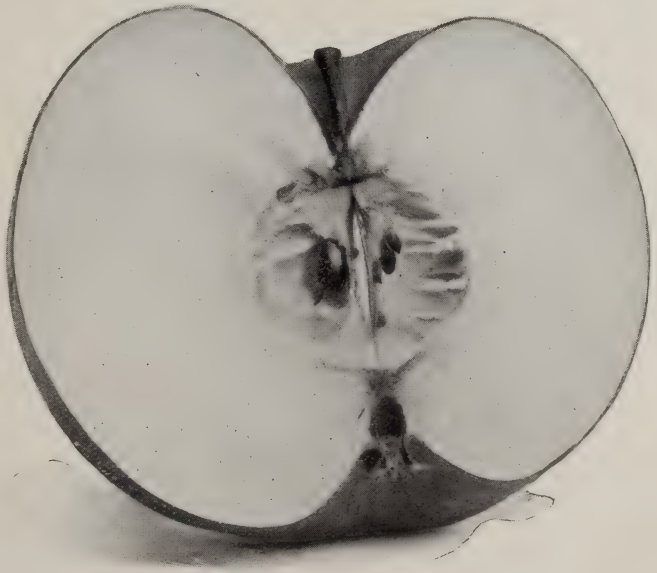
VALUE : home market, first class ; foreign market, second class.

SEASON : September and October.

ADAPTATION : hardy generally over the province, except the extreme north.



ST. LAWRENCE.



ST. LAWRENCE.



## SCARLET PIPPIN.

A fancy dessert apple which is esteemed profitable to grow for market along the River St. Lawrence.

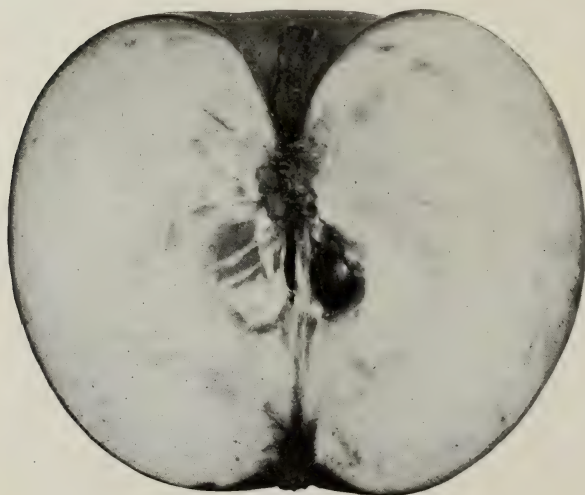
ORIGIN: near Brockville in Leeds County. A chance seedling.

TREE: upright in habit; hardy; vigorous and very productive; inclined to overbear.

FRUIT: roundish oblate; skin, waxy white, streaked; splashed or almost entirely covered with bright scarlet covering; stem stout, one-half to three-quarters of an inch long in a narrow, moderately deep cavity; calyx closed in a narrow, very shallow basin.



SCARLET PIPPIN.



SECTION OF SCARLET PIPPIN.

FLESH: pure white; texture tender, fine, crisp, breaking, juicy, with a subacid flavor.

QUALITY: dessert, best; cooking, good.

VALUE: special market, first class.

SEASON: October to February; at its best in October and November.

## SALOME.

A new Western apple which promises to be of some value in the Province of Ontario. The hardiness of the tree, the clean bright color of the fruit and its long keeping quality seem to combine in its favor as a commercial variety, especially in the colder sections.

ORIGIN: E. C. Hathaway, Ottawa, Illinois.

TREE: hardy, productive, a slow grower, an early and an annual bearer.

FRUIT: size medium; form roundish, conical, somewhat angular or lopsided; color bright red with stripes of darker red and numerous small grey dots on a yellowish ground; when

harvested the skin is green, but during the winter it takes on the coloring above described, making it very attractive; stem stout, three-quarters of an inch long, set in a deep, uneven cavity; calyx half closed, segments erect, in a moderately deep, slightly plaited basin, having five distinct prominences; core large, open, sessile.

FLESH : color yellowish; texture tender, firm, becoming toward spring moderately juicy; flavor pleasant, subacid.

QUALITY : dessert or cooking, fair to good.

VALUE : promising for export.

SEASON : November to March,

ADAPTATION : succeeds remarkably well in the County of Simcoe and at other favored points in the north.

#### SCOTT WINTER.



SCOTT WINTER.

In the province of Quebec this is considered the best late winter cooking apple, the tree being very hardy and the fruit a long keeper; useful for the northerly limits of apple culture.

ORIGIN : On the Scott farm, Newport, Vermont. Introduced by Dr. Hoskins, of Newport.

TREE : vigorous; habit upright; productive, an early bearer.

FRUIT : size small to medium; form roundish oblate, slightly conical; skin yellow, washed, striped and splashed with red; stem short set in a regular, deep, russeted cavity; calyx closed in a narrow abrupt, wavy basin.

FLESH : color yellow; texture fine grained, crisp, juicy; flavor pleasant, slightly acid.

QUALITY : dessert fair; cooking good.

VALUE : fruit rather small, for market except under high cultivation.

SEASON : late winter.



SECTION OF SCOTT WINTER.



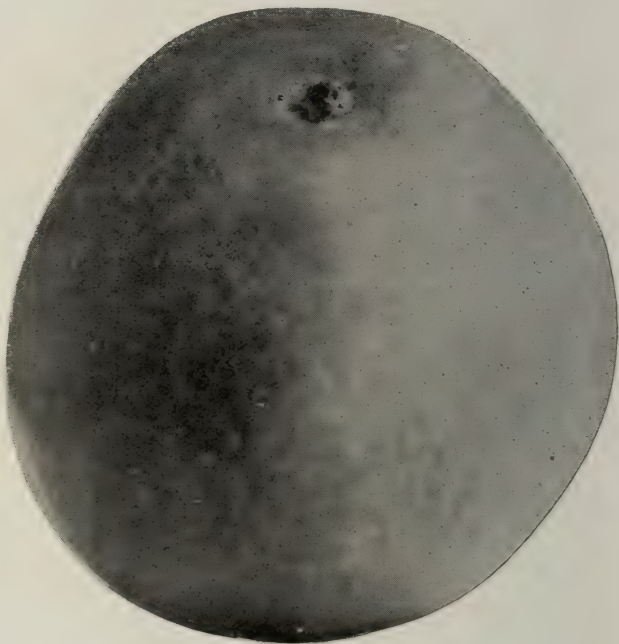
SEEK-NO-FURTHER (*Westfield.*)

An old commercial variety, at one time considerably planted in some parts of Ontario, and still highly valued by some apple growers. Not much planted in the newer orchards.

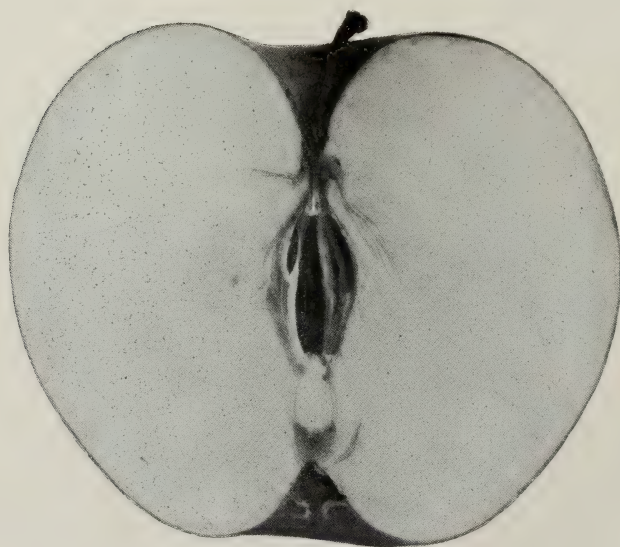
ORIGIN : near Westfield, Connecticut, U.S.A., about 1796.

TREE : vigorous ; habit spreading ; productive. Succeeds best on rich sandy loam.

FRUIT : size medium ; form roundish conical ; skin greenish yellow shaded with dull red, striped with bright red, with russet veinings and a few large prominent yellow



SEEK-NO-FURTHER.



SECTION OF SEEK-NO-FURTHER.

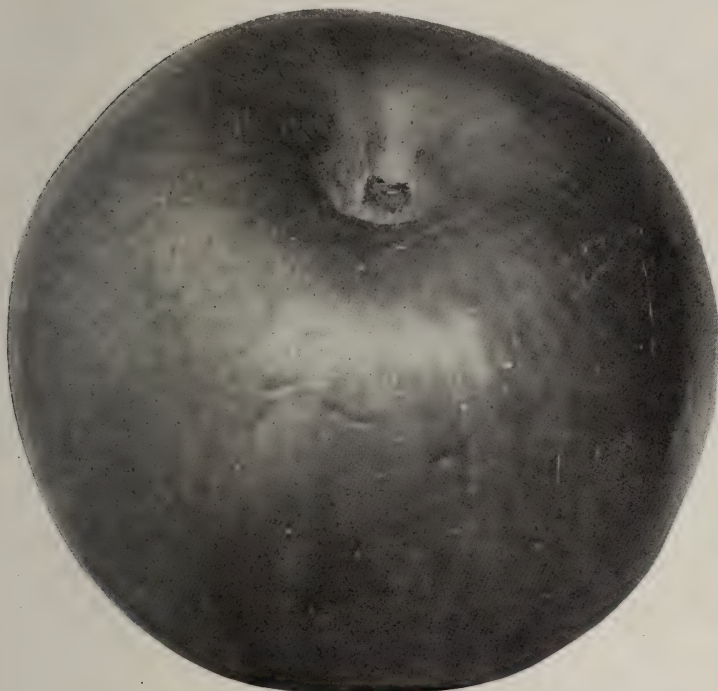
dots ; stem short in a deep, slightly russeted cavity ; calyx usually open in a narrow, shallow leather cracked basin ; not subject to scab.

FLESH : yellowish white ; fine grained, tender : flavor spicy, pleasant, subacid.

QUALITY : dessert very good ; cooking fair.

VALUE : market first to second class.

SEASON : October to February.

SHIAWASSEE (*Shiawassee Beauty*.)

SHIAWASSEE BEAUTY.

A fine variety of the Fameuse type; much less subject to scab than Fameuse itself. A fancy variety for dessert purposes.

ORIGIN: in Shiawassee County, Michigan, supposed to be a seedling of Fameuse.

TREE: hardy; vigorous; upright; productive alternate years.

FRUIT: size medium to large; form decidedly oblate; color yellowish ground, almost entirely covered with stripes, splashings and mottlings of dark crimson, and a few large prominent yellowish

dots; stem slender, three-quarters of an inch long, set in a broad deep cavity; calyx usually closed, in a large deep basin.

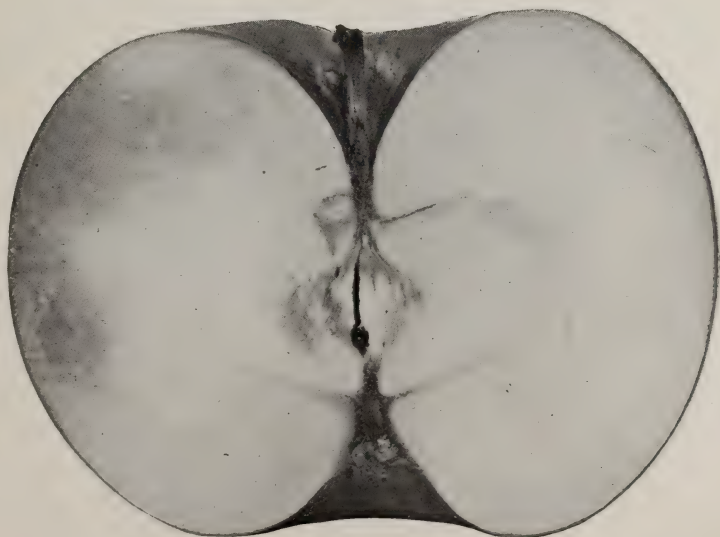
FLESH: color very white; texture firm, very crisp, juicy, fine grained; flavor excellent.

QUALITY: cooking, fair; dessert very good.

VALUE: home or foreign market promising.

SEASON: October to January.

ADAPTATION: Can be grown wherever Fameuse succeeds.



SECTION OF SHIAWASSEE BEAUTY.



SPITZENBURG (*Esopus Spitzenburg*.)

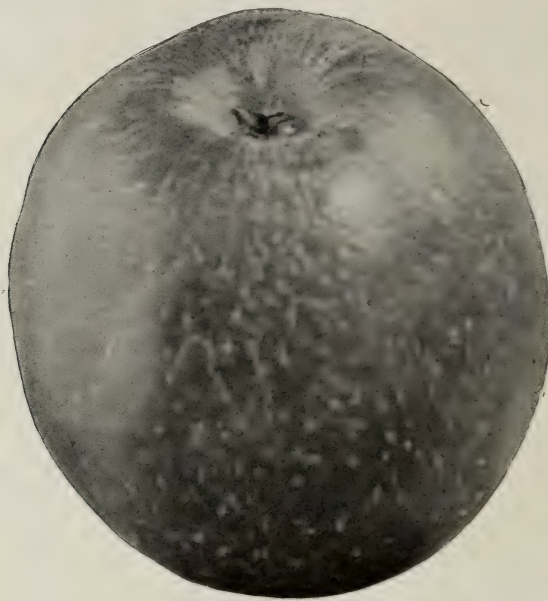
One of the finest dessert apples for late winter use, and widely planted by early settlers throughout Southern Ontario. It has proved to be unprofitable as a commercial apple, because the tree is a weak grower, and yields small crops.

ORIGIN: *Esopus*, on the Hudson river, previous to 1798.

TREE: lacking in vigor, often showing dead or feeble wood; upright, spreading, with drooping limbs when in bearing; fairly hardy.

FRUIT: size medium to large, oblong, slightly conical; skin straw color in shade, but usually nearly covered with bright red, and dark red in sun, with a few stripes, and many obscure gray dots; stalk seven-eighths of an inch long in a narrow deep cavity; calyx nearly closed, set in a narrow basin of medium depth, slightly corrugated.

FLESH: yellowish white; texture crisp, juicy, breaking; flavor brisk, rich, delicious.



SPITZENBURGH.

QUALITY: first class for all purposes.

SEASON: November to February.



SECTION OF SPITZENBURG.

ADAPTATION: succeeds well on sandy loam in Southern Ontario.

SPY (*Northern Spy*).

The Spy stands in the very first rank of Canadian apples, whether for home or foreign markets. Originating in New York State on the line with the southern portion of the Province of

Ontario, it succeeds here to perfection. Its beauty of coloring, half shaded by its delicate bloom, and its great excellence of quality for all purposes, justly claim for it its wide popularity. In Chicago, Canadian Spys are more sought for than any other variety, but owing to tenderness of skin, which shows the slightest bruise, it is less popular for export to Great Britain than some other varieties. The tree is late in coming into bearing, often being fifteen years planted before yielding a crop, and this renders the variety somewhat unpopular with planters. Probably for fancy packages, selected Spys would be among the best.

ORIGIN: near Rochester, N.Y., introduced about 1850.

TREE: upright and spreading in habit; fruit spurs on interior boughs;

very vigorous, late in coming into bearing, but afterwards very productive in alternate years; blossoms late in spring and holds its fruit late in the autumn; requires high cultivation and good fertility.

FRUIT: large to very large; form roundish, slightly conical; skin thin, light green, or pale yellow, sprinkled with light pink, striped and shaded with pinkish red, and covered with thin whitish bloom; stalk slender, three-quarters of an inch long, in a wide, deep, sometimes russeted cavity; calyx small, closed, in a narrow, moderately deep, abrupt, irregular basin.

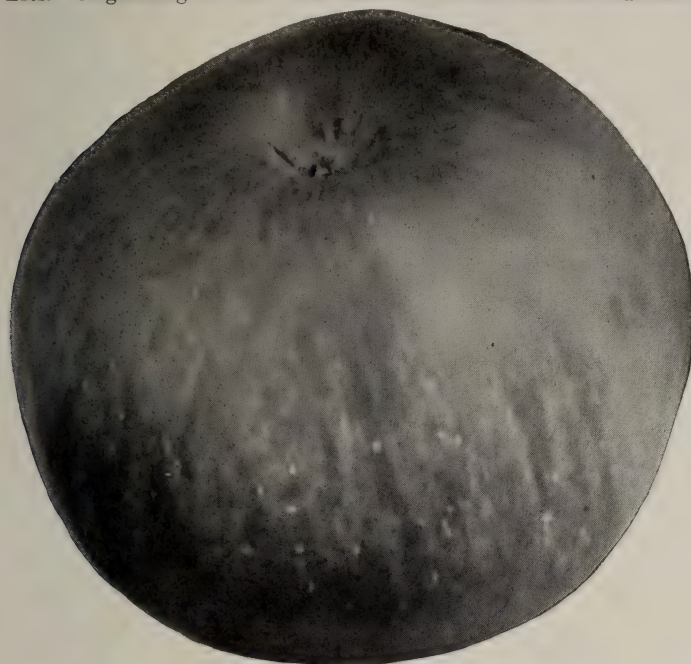
FLESH: white; texture fine grained, crisp, tender, juicy; flavor rich, sprightly, subacid, fragrant.

QUALITY: dessert and cooking, best.

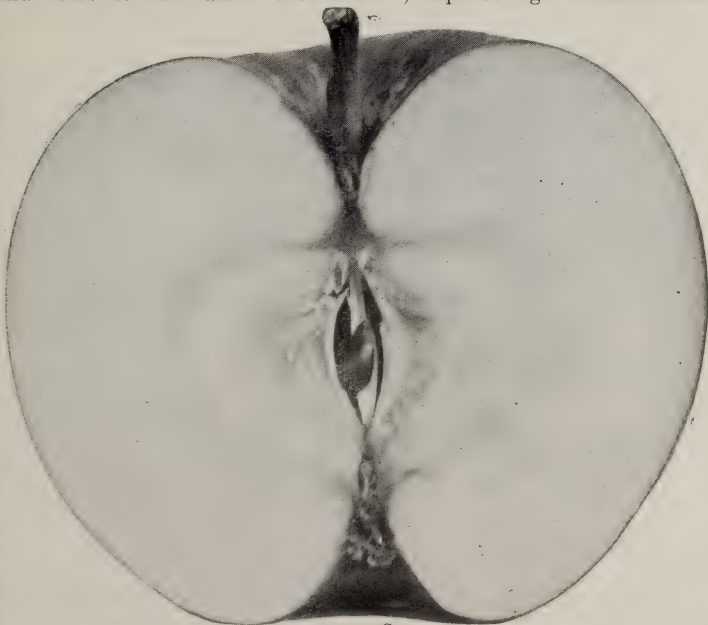
VALUE: home market first class; skin a little tender for distant shipment unless handled with care and wrapped with paper.

SEASON: January to May.

ADAPTATION: sandy or clay loams in Southern and Middle Ontario; found tender at the St Lawrence Experiment Station, and also at the Lake Simcoe Station, except where top grafted to hardy stock.



SPY.



SECTION OF SPY.



## STARK.



STARK.

The Stark has been tested in a commercial way in Ontario by many growers in the Bay of Quinte District, and is considered a good winter apple for export, being about as profitable as Ben Davis, and somewhat better in quality its dull red color is a serious fault.

ORIGIN: Ohio.

TREE: a stout vigorous grower, very productive each alternate year; foliage large, dark green, somewhat subject to fungus.

FRUIT: large form; roundish, slightly one-sided, somewhat oblong conical; skin covered with shades and splashes of light and dark red

on a greenish yellow ground, thickly sprinkled with brown dots; stalk one-half inch long, stout, in a small cavity of medium depth; calyx large, half-closed, in a large shallow, plaited basin; flesh yellowish white; texture a little coarse, firm and moderately juicy; flavor mild, sub-acid, good.

QUALITY: dessert poor; cooking good.

VALUE: home market second class; foreign market first class.

SEASON: January to May.



SECTION OF STARK.

## STUMP.

An attractive looking fall apple, sometimes shown at our Provincial Fair ; considered a fairly profitable variety.

ORIGIN : United States ; Thomas says in Monroe County, N. Y., while Downing supposes that it originated in the State of Delaware.

TREE : spreading, productive.

FRUIT : size medium ; form oblate conical ; color yellowish, splashed and blotched, with bright red ; stem stout,  $\frac{3}{8}$  of an inch long, in a narrow, moderately deep, funnel-shaped cavity ; calyx half open, set in a deep wrinkled basin.

FLESH : color white ; texture crisp, juicy, firm ; flavor subacid.

QUALITY : fair for dessert ; good for cooking.

VALUE : home market first class ; foreign market second class.

SEASON : September and October.

SWAYZIE. (*Swazie Pomme Grise, Pomme Grise d'Or.*)

There is no choicer winter dessert apple for the months of December and January than the Swazie Pomme Grise, especially when kept in a cool, dark cellar, so that its crisp texture and excellent flavor may be preserved. Unfortunately, it is not very productive, and, consequently, not profitable. One large tree at Maplehurst, seventy-five years planted, yielded only an average of four barrels each alternate year. It is well worthy of a place in the amateur collection.

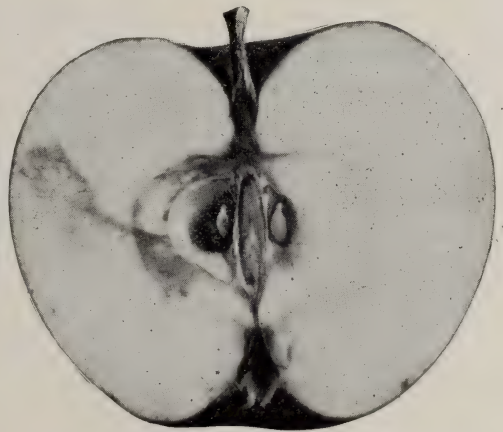
ORIGIN : probably with Col. Swayzie, near Niagara.

TREE : upright, fairly vigorous and not very productive.

FRUIT : small, round, oblate conical ; color deep yellow, well colored with cinnamon russet



SWAYZIE.



SECTION OF SWAYZIE.

and many whitish dots ; stem three-quarters of an inch long, set in a deep cavity ; calyx closed in a moderately deep, slightly corrugated basin.

FLESH : white, texture fine grained, tender, crisp, juicy ; flavor aromatic, mild sub-acid pleasant.

QUALITY : dessert first class ; cooking third class.

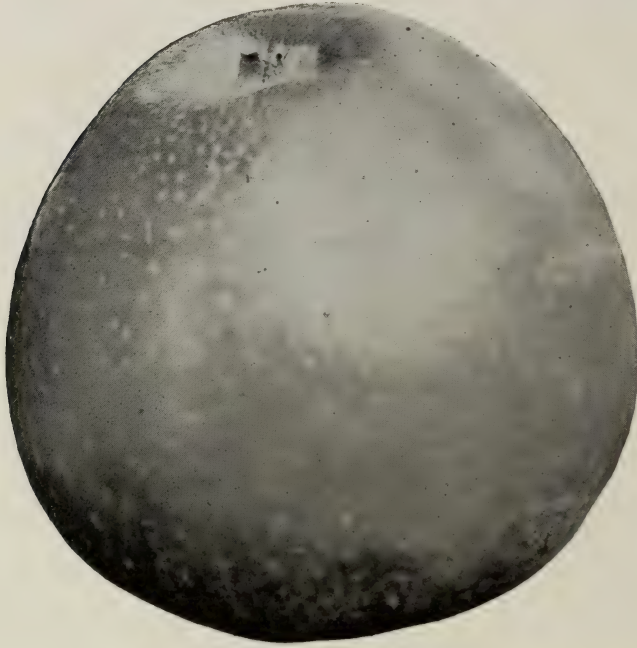
VALUE : for home market second class ; for foreign market second-class.

SEASON : December to March.

ADAPTATION : succeeds in best apple districts.



## SWEET BOUGH.

*(Large Yellow Bough of Downing.)*

SWEET BOUGH.

An excellent dessert apple, ripening about the same season as the Early Harvest; not subject to scab, and a favorite with those who prefer a sweet to a sour apple. Not profitable to grow for market, but it deserves a place in every collection for home use. Baked whole it is delicious eaten with cream.

ORIGIN: United States.

TREE: of medium vigor, never attaining a large size, and, therefore, even with a full crop, not very productive. Bears full every alternate year; head compact.

FRUIT: large, ovate, con-

cal; skin smooth, greenish yellow; stem one inch long, in a narrow, deep, regular cavity; calyx open, in a shallow, irregular basin.

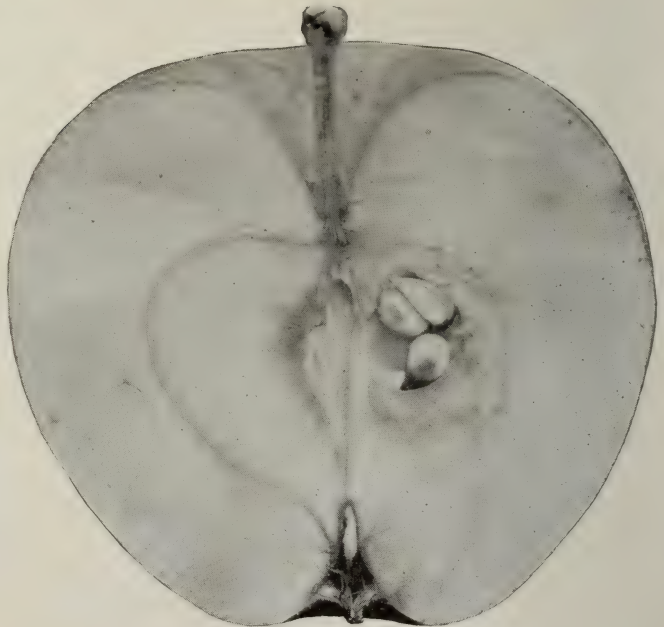
FLESH: white, finegrained, tender and juicy; flavor moderately sweet, rich and agreeable.

QUALITY: dessert very good; cooking poor, except for roasting.

VALUE: home market, second class; foreign market useless.

SEASON: late July to middle of August.

ADAPTATION: succeeds in best apple districts.



SECTION OF SWEET BOUGH.

TITOVKA (*Titus Apple.*)

A variety as yet little known or tested in Canada. In season it follows the Duchess. It is a favorite market apple in middle Russia and is found to endure the severest winters. At

Grimsby, grown as a top graft, it is inclined to drop its fruit about the middle of August, and almost before fully colored. Probably a fine variety for export in cold storage to succeed Duchess.

ORIGIN : Russia.

TREE . very hardy and productive.

FRUIT: large, oblong to roundish, often flattened at base and apex, somewhat irregular on sides ; color yellowish green, almost covered with stripes and shadings of bright red, and light green dots ; cavity narrow, deep and irregular ; stem about three quarters of an inch long, stout ; basin large, plaited at bottom ; calyx nearly closed, segments recurved.

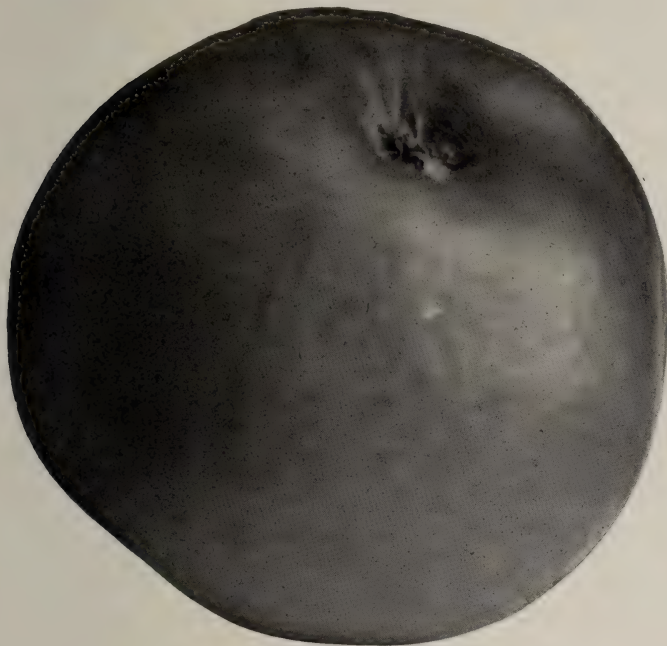
FLESH : white ; texture firm, moderately juicy ; flavor brisk, tart.

QUALITY : dessert poor ; cooking good.

VALUE: home market first-class.

SEASON: August and September.

ADAPTATION : worthy of trial where Wealthy or Duchess succeed.



TOLMAN.

### TOLMAN.

(*Tallman Sweet.*)

The best winter sweet apple ; valuable for baking and by some people esteemed a good dessert apple ; useful also as stock feed, in place of roots ; not of much value for export.

ORIGIN : a native of Rhode Island.

TREE : a vigorous grower, very productive and very hardy ; valuable as a stock upon which to top graft other and more tender varieties, as, for example, the King, which is more productive, and the Spy,

which may be grown farther north, when top grafted upon the Tolman than when upon common stock.

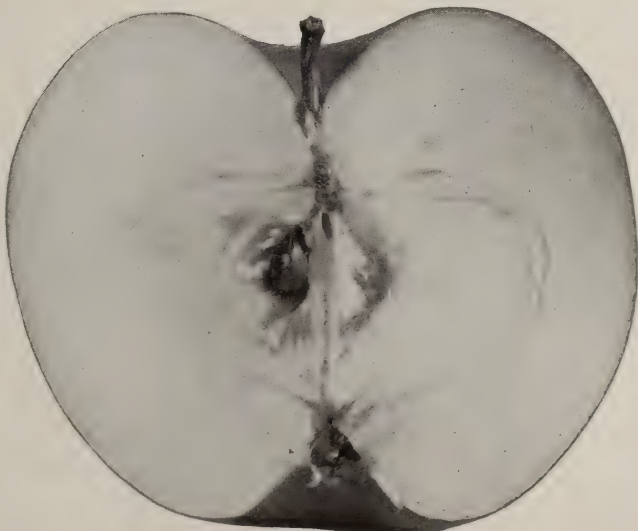
FRUIT: size medium; form roundish ; color light yellow, sometimes with reddish cheek, and a line from stem to calyx ; stem half an inch long, often inclined, inserted in a wide shallow cavity ; calyx closed in a small shallow basin.

FLESH: color white ; texture firm, fine grained ; flavor sweet, rich.

QUALITY : dessert good ; cooking fair.

VALUE : second class, except in special markets and in limited quantities.

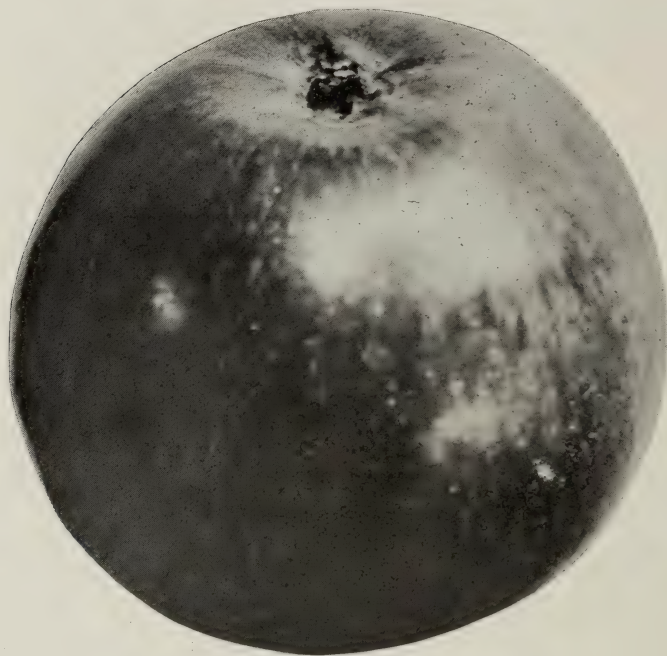
SEASON : November : to April,



SECTION OF TOLMAN.



## TRENTON.



TRENTON.

ORIGIN : seed of Golden Russet by Spy, raised by Mr. P. Dempsey, Albury, Prince Edward County.

TREE : vigorous; spreading.

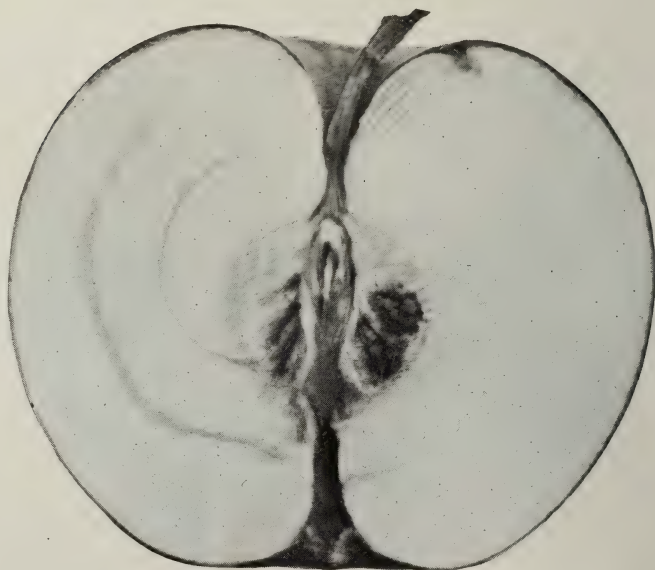
FRUIT : size medium ; color red on yellow ground, with numerous splashes and stripes of dark red and many white dots ; form round oblate ; stem five-eighths of an inch long in a deep cavity ; calyx partly open, in a deep basin.

FLESH : color yellow ; texture tender, crisp, juicy ; flavor pleasant, subacid.

QUALITY : dessert good.

VALUE : first class, though it has only been tested to a limited extent.

SEASON : September and October.



SECTION OF TRENTON.

## TRANSCENDENT.

An excellent early autumn variety of the hybrid crabs.

ORIGIN : United States.

TREE : of moderate slender growth, hardy, somewhat subject to twig blight.

FRUIT : medium for its class ; form roundish oblong, flattened at ends, ribbed ; color of skin golden yellow, with crimson cheek and thin whitish bloom ; stem one and a quarter inches long, set in an open deep cavity ; calyx closed, segments large, set in a hollow slightly corrugated basin ; somewhat subject to scab.

FLESH : color yellowish ; texture crisp and moderately firm ; flavor acid, slightly astringent, becoming pleasant when fully ripe.

SEASON : August and September.



TRANSCENDENT.

## VANDEVERE.

An old variety, originated at Wilmington, Delaware.

FRUIT : medium, oblate ; surface waxen yellow, striped with red ; dots numerous, green ; cavity deep ; stem about one inch long ; basin round, moderate ; calyx small, closed.

FLESH : yellowish, compact, but tender, with a fine rich subacid flavor ; good ; valuable for culinary use. October to January. (*Budd.*)

WALBRIDGE. (*Edgar Redstreak.*)

A good winter variety for northern sections, on account of the hardness of the tree, but not commended for the apple orchards of the more favored districts.

ORIGIN : Edgar Co., Illinois, and first known as Edgar Redstreak.

TREE : vigorous ; habit spreading ; a tardy and often a shy bearer.

FRUIT : size medium ; form round conic ; skin pale yellow, shaded with pale red and having stripes and splashes of bright red on the sunny side, and a few obscure whitish dots ; stem short in an acute regular cavity ; calyx closed in a narrow flat basin.

FLESH : color white ; texture tender, juicy ; flavor mild subacid.

QUALITY : dessert fair ; cooking good, but rather small.

VALUE : market second class.

SEASON : December to March.



## WAGENER.



WAGENER.

A fine dessert apple when grown and highly colored, but samples grown in the shade are inferior both in appearance and in flavor. The texture of the fruit is too tender to be planted in the commercial orchard.

ORIGIN: Abram Wagener, Penn Yan, N. Y., in 1796.

TREE: a slow grower and an early bearer; not long lived.

FRUIT: medium to large, form oblate; color yellow, nearly covered with crimson, obscurely striped, with a few light dots; stem about seven-eighths of an inch long, inserted in a broad,

deep, irregular cavity; calyx closed, set in a funnel form, somewhat corrugated basin.

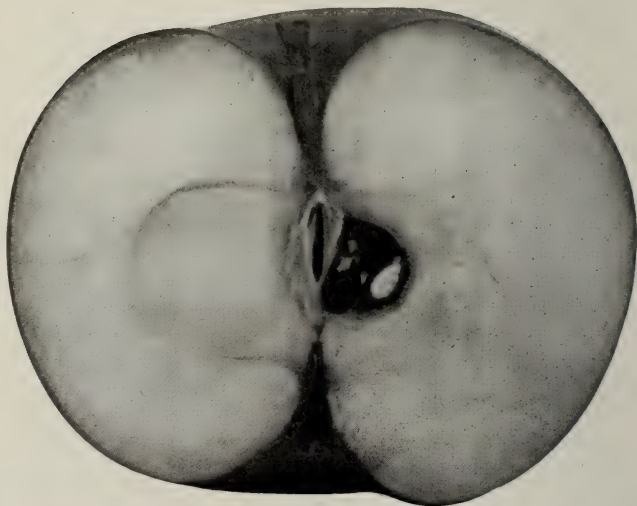
FLESH: yellowish, texture fine grained, very tender, juicy; flavor subacid, very agreeable.

QUALITY: dessert very good, cooking good.

VALUE: home market first class, foreign market second class.

SEASON: November to February.

ADAPTATION: succeeds in best apple sections.



SECTION OF WAGENER.

## WEALTHY.

This beautiful apple was distributed among the members of the Ontario Fruit Growers' Association in 1882 for trial, and has won for itself a good reputation in every part of

Province as a dessert apple of excellent quality, while in the northern portions it is especially desirable on account of its hardiness.

ORIGIN : St. Paul, Minnesota, by Peter Gideon.

TREE : vigorous, very hardy, over productive.

FRUIT : medium, roundish, oblate, regular ; skin, smooth, greenish ground, changing to pale yellow, rich, red cheek, with stripes and splashes of red in the sun, sometimes nearly covered with crimson ; stem one-half to three-quarters of an inch long in a deep, regular cavity ; calyx nearly closed in a deep, abrupt basin.



WEALTHY.

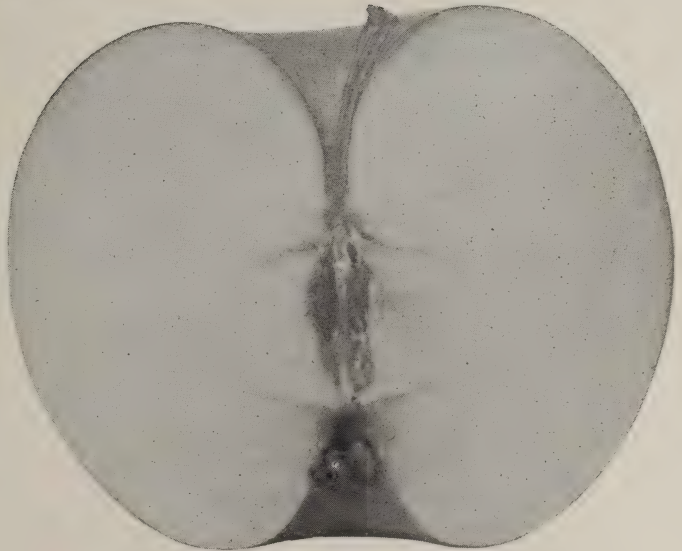
FLESH : white, texture fine grained, tender, juicy, sprightly, pleasant subacid.

QUALITY : dessert very good ; cooking good.

VALUE : for home market first class ; for foreign market first class.

SEASON : September to November.

ADAPTATION : succeeds throughout the Province generally.



SECTION OF WEALTHY.

## WOLF RIVER.

The Wolf River is an apple that might be included in a list for export. It is a little later in season than Alexander, and is supplanting that variety in some sections.

ORIGIN : a seedling of the Alexander, and originated in Wisconsin on the bank of Wolf River.

TREE : very hardy, vigorous and fairly productive ; an early bearer.

FRUIT : very large, oblate, or roundish oblate, usually regular in size ; skin light yellow, shaded with dark red or crimson in sun, with a few yellowish dots ; stem three-quarters of an

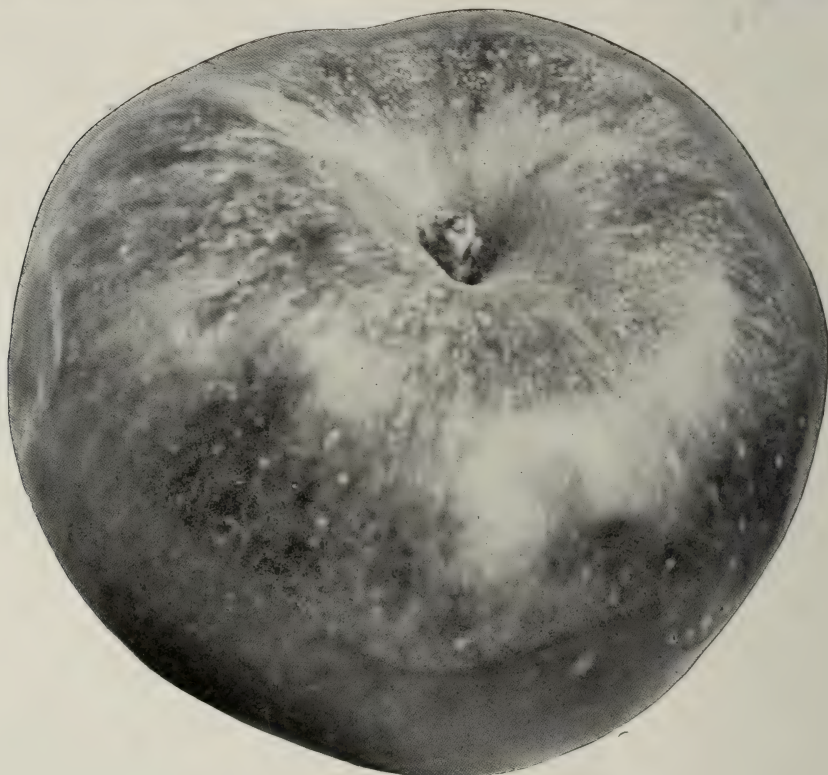


inch long, set in a narrow deep basin, of a green or russet color; calyx open, in a narrow, deep, green wrinkled basin.

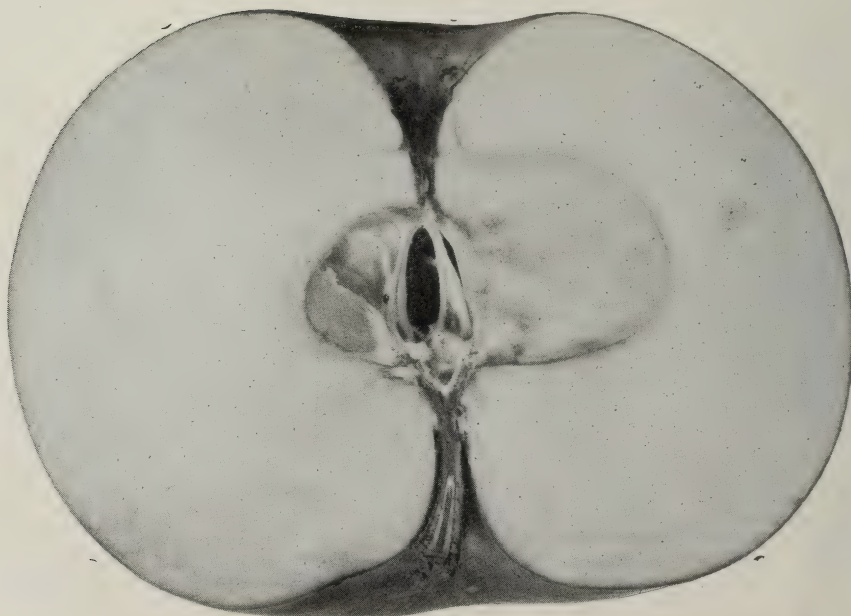
FLESH: yellowish white, moderately firm in texture, not fine-grained, juicy, with a pleasant subacid flavor.

SEASON: October and November.

ADAPTATION: general throughout the Province, but specially successful in the north.



WOLF RIVER.



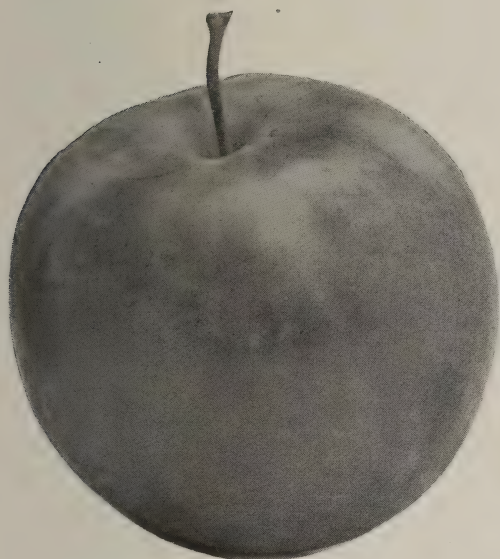
## WHITNEY.

*(Whitney No. 20).*

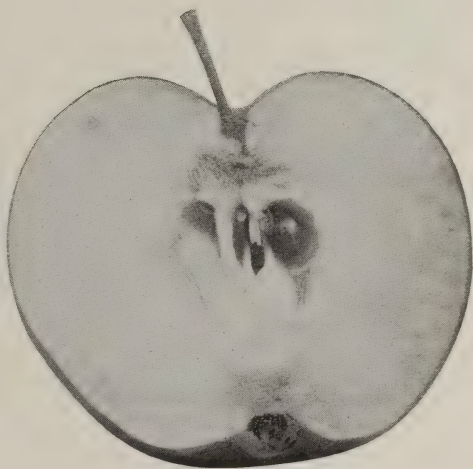
A hybrid crab, which originated in Illinois, and has proved itself valuable in Northern Illinois, in Minnesota, and in some parts of our Canadian North West. As long ago as 1834, this apple was in bearing at Prince Albert in Alberta, and the Board of Control of our Ontario Fruit Experiment stations is having it tested in several places in New Ontario.

The apple is large for its class ; it is a good cooking apple and a fair dessert apple.

TREE : productive ; very hardy.



Whitney.



Section of Whitney.

FRUIT : medium size ; form roundish conical, slightly angular ; color dark red, splashed with dark crimson on a yellow ground, with obscure small white dots ; stem one inch long set in a flat wrinkled basin ; calyx closed in a regular slightly russeted basin.

FLESH : color yellowish ; texture tender, juicy ; flavor subacid.

QUALITY : cooking very good ; dessert good.

VALUE : special market first class.

SEASON : August to September.



YELLOW BELLFLOWER. (*Bishop's Pippin of Nova Scotia.*)

YELLOW BELLFLOWER.

**FRUIT:** size large; form apparently oblong, because tapering towards calyx, somewhat angular and ribbed; color pale yellow, often with a beautiful blush on the sunny side and numerous obscure whitish dots; stem slender, one inch long, in a narrow deep cavity; calyx closed in a small corrugated basin.

**FLESH:** color yellow; texture tender, juicy and crisp; flavor sprightly subacid, agreeable when eaten in season.

**QUALITY:** dessert good; cooking good.

**VALUE:** home market first class.

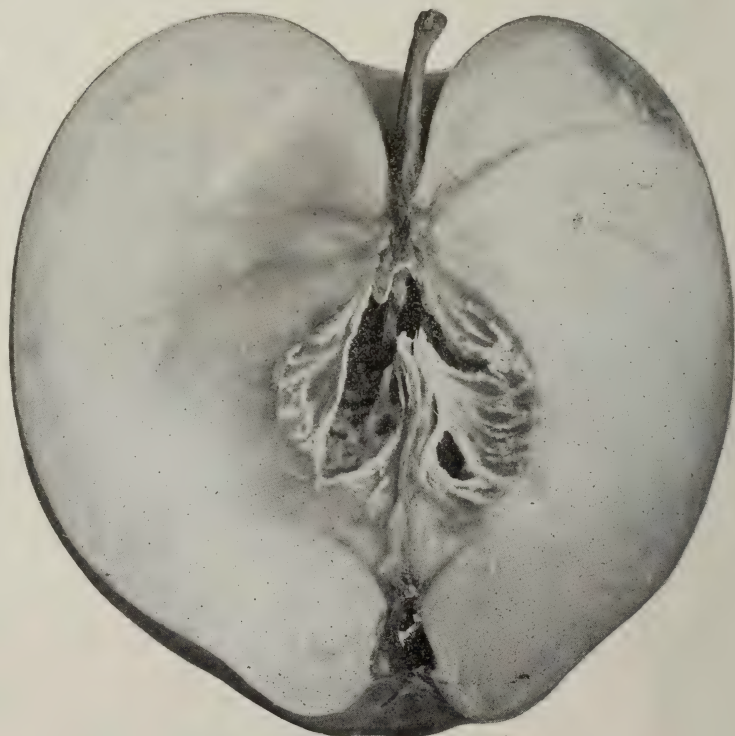
**SEASON:** December to February.

**ADAPTATION:** general, except in extreme northern sections.

At one time the Bellflower was planted to some extent in Ontario orchards, but the tree has proved itself irregular in its bearing habits, sometimes producing magnificent samples, and at other times small and poorly colored fruit, and the fruit is tender and shows very slight bruises, so that we cannot recommend it as worthy of a place among the most profitable varieties.

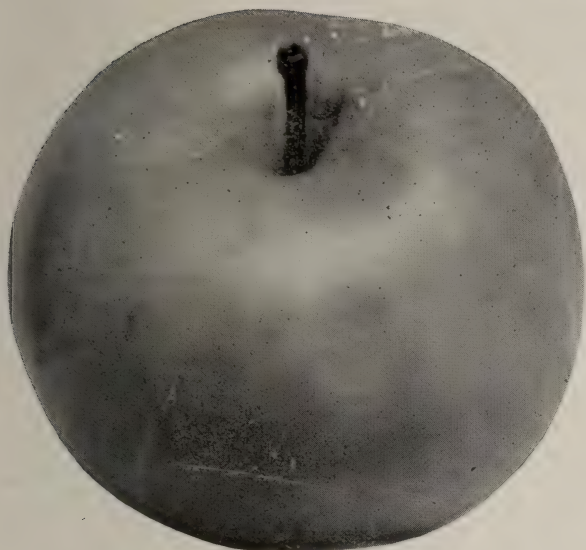
**ORIGIN:** Burlington, N. J.

**TREE:** vigorous, forming a roundish, spreading and somewhat drooping head; productive alternate years.



SECTION OF YELLOW BELLFLOWER.

## YELLOW TRANSPARENT.



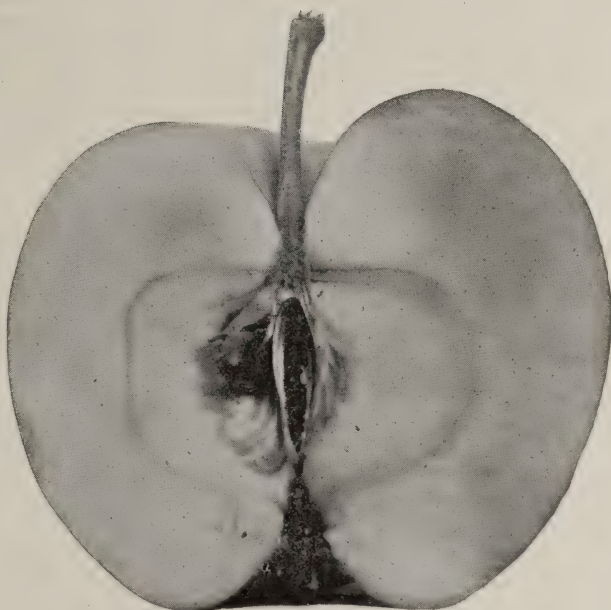
YELLOW TRANSPARENT.

**FRUIT:** above medium, roundish, oblate, inclined to be conical; skin clear white, yellowish white when very mature; dots light green, obscure; stalk medium, in large cavity; calyx closed in medium, slightly corrugated basin; fruit hangs well on the tree; cuts show fruit below normal size.

**FLESH:** white; texture firm till very ripe, then tender; quality second class.

**SEASON:** early August.

**ADAPTATION:** succeeds almost everywhere over the Province.



SECTION OF YELLOW TRANSPARENT.

## YORK IMPERIAL.

A fine export market apple, highly valued in some of the American States, but not yet much grown in Ontario.

**ORIGIN:** York County, Pa.

**TREE:** a moderate grower, productive.

**FRUIT:** medium in size; angular, oblique; color of skin, bright red in shades, stripes and splashes on a yellowish ground; stem half an inch long in a deep funnel-shaped cavity; calyx nearly closed in an irregular deep, slightly plaited basin.

**FLESH:** yellowish; texture firm and juicy; flavor, subacid, good.

**QUALITY:** dessert fair; cooking good.

**VALUE:** first class for market.

**SEASON:** January to March.



## THE CHERRY.

The cherry, which for a time was a comparatively neglected fruit in Ontario, is now being more largely planted and better culture is being given it. As a result, this delicious fruit is now being produced in fairly large quantities in certain sections, and as the crop is more uncertain than that of any of the other large fruits, the prices obtained for cherries are good.

There are three well recognized groups into which the cultivated cherries are divided, the Morello or Sour cherries, the Bigarreau, Heart, or Sweet cherries, and the Duke cherries, which are intermediate between the other two groups, the fruit being usually subacid. The hardiest varieties are found in the Morello group, and for this reason these Sour cherries have succeeded over a much larger part of Ontario than the others. The eastern limit of the commercial culture of the Sour cherries is about the city of Kingston, but north-east of that district along the St. Lawrence River, especially within twenty or thirty miles of the water, they succeed admirably. They are not grown to any extent north of latitude 45 degrees, as it has been found that the dry cold winters kill the fruit buds, and it is only rarely that a crop is produced. Near the northern limit of the successful culture of Sour cherries, it has been found that large bodies of water have a very beneficial influence in lessening the winter injury.

The Sweet and Duke cherries have a much narrower range than the Sour cherries. While they will succeed along Lake Ontario east of Toronto, where the influence of the water moderates the climate, the crops are too uncertain for their commercial culture, hence this is confined mainly to the south-western parts of the Province.

More care is required in choosing a site for cherries than for apples. A warm sandy loam or gravelly well-drained soil is to be preferred, and while the trees may succeed for a time on poorly drained cold soil, they will not reach a great age and are not likely to prove profitable. A site should if possible be chosen where there is the least danger from spring and summer frosts, as cherry blossoms are tender.

The preparation of the land for apple trees and directions for planting of the same may be followed for the cherry, but even more care should be taken in planting, as cherries are much harder to transplant than apples. For this reason one or two year old trees should be used, as the loss from planting older trees is liable to be great.

As the trees of the Morello cherries do not reach a great size, they may be planted closer than the others; from eighteen to twenty feet apart being sufficient; while for the Sweet cherries twenty-five feet is not too much. The Duke cherries, which do not grow quite so large as the Sweet, may be planted about twenty feet apart.

The pruning to shape the cherry tree is much the same as for the apple, but after the tree becomes well shaped the less pruning done the better. Often serious injury occurs when cherry trees are severely pruned. Gum oozing from the tree is an indication of such injury.

Thorough cultivation is as necessary for cherries as for apples, and cover crops are, if anything, more necessary.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

*Hardy:* Orel 25, Orel 24, Richmond, Montmorency, Russian 207.

## DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Niagara District:* By Linus Wolverton, Grimsby, Ont.

*Commercial:* Wood, Knight, Napoleon, Tartarian, Dyehouse, Montmorency, Late Duke, Elkhorn, Windsor, Morello.

*Domestic:* May Duke, Cleveland, Knight, Elton, Tartarian, Hortense, Choisy, Eagle, Mezel, Royal Duke.

*Lake Simcoe District:* By G. C. Caston, Craighurst, Ont.

*Commercial and Domestic:* Orel 24, Ostheim, Litham, Russian 207, Bessarabian, Dyehouse, Morello.

*Algoma District:* By Charles Young, Richard's Landing, Ont.

*Commercial and Domestic:* Richmond, Montmorency, Morello.

*Bay of Quinte District:* By W. H. Dempsey, Trenton, Ont.

*Commercial and Domestic:* Richmond, Montmorency.

*St. Lawrence District:* By Harold Jones, Maitland, Ont.

*Commercial and Domestic:* Richmond, Montmorency, Orel 24, Morello.

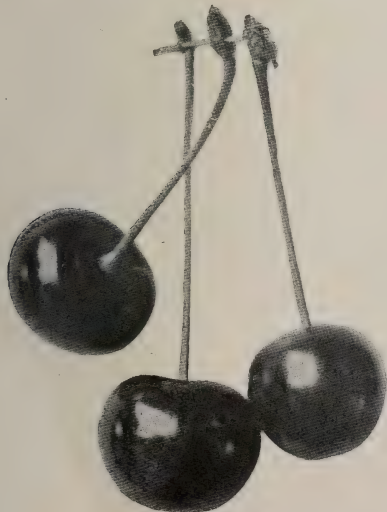
## DESCRIPTION OF VARIETIES.

## CALIFORNIA ADVANCE.

A fine Duke cherry, so similar in both season and in character to the Late Duke, that we are inclined to think the two identical. Introduced by the Stark Nurseries of Louisiana, U.S.

CHOISY. (*Belle de Choisy, Ambree grosse of LeRoy.*)

The most delicious of all dessert cherries, and one that should be planted in every amateur's garden; but of no value in the commercial cherry orchard, because not productive, and the tree is often short lived.



CHOISY.

ORIGIN: Choisy, near Paris, 1760.

TREE: upright; foliage dark; hardy; not very productive; group, Duke.

FRUIT: medium to large,  $\frac{3}{4} \times \frac{3}{4}$ , obtuse heart-shaped; skin transparent, showing the structure of the flesh and the cells of juice within; color bright cornelian red in sun, pale red to amber in shade; stem slender, two inches long; suture marked by a delicate line.

FLESH: very pale red; texture soft, juicy; flavor sweet, very delicious.

QUALITY: dessert very good.

VALUE: market second class.

SEASON: late June.

ADAPTATION: Southern Ontario.



## CLEVELAND.

One of the finest Bigarreau cherries for dessert purposes, being of high quality and not too firm in texture. A good variety for commercial orchards, because of its high color and earliness of season, but not yet fully tested in this Province.

ORIGIN : by Prof. Kirtland, Cleveland, Ohio.

TREE : vigorous ; of stout spreading habit ; productive, fruited after three years planting at Maplehurst ; group, Heart.

FRUIT : large,  $\frac{7}{8} \times \frac{1}{2}$  of an inch ; form heart-shaped, sides unequal ; color bright red maroon, on yellowish ground, dark rich red in the sun ; stem stout,  $1\frac{1}{2}$  inches long in a broad, uneven cavity ; suture broad, half way round.

FLESH : light cream in color ; texture almost tender, juicy ; flavor sweet, rich and delicious.

QUALITY : first-class for table.

VALUE : home market good ; distant market good.

SEASON : late June.



CLEVELAND.

COE. (*Coe's Transparent.*)

A good variety for the home garden, but altogether too tender to be popular for the commercial orchard.

ORIGIN ; in Connecticut, with Curtis Coe, of Middleton.

TREE : healthy, fairly vigorous, with round spreading head, third rate in productiveness : group, Heart.

FRUIT : medium to large ; round and regular in form ; skin thin, bright shiny amber, nearly covered with rich cornelian, marked with peculiar mottled blotches ; stalk one and a half to two inches long set in a medium wide cavity ; suture obscure.

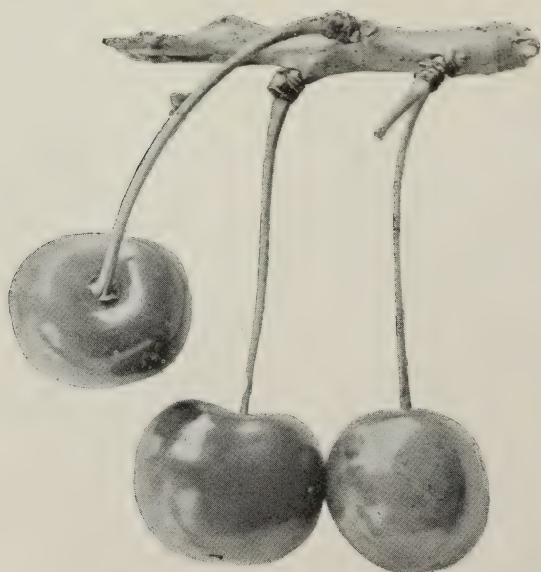
FLESH : very pale yellowish tint ; texture very soft and tender, juicy ; flavor very good if not left hanging too long.

QUALITY ; good for dessert.

VALUE : second class for home market ; fourth class for distant market.

SEASON ; early July.

ADAPTATION : south of Lake Ontario.



COE.

DOWNER. (*Downer's Late*)

A delicious dessert cherry.

ORIGIN : Massachusetts.

TREE : a vigorous, upright grower ; fairly productive ; group, Heart.

FRUIT : size large  $\frac{3}{4}$  x  $\frac{3}{4}$  ; form heart-shaped ; stem  $1\frac{1}{4}$  x  $1\frac{1}{2}$  inches long ; apex a slight depression ; color bright shiny red, marbled.

FLESH : creamy white ; texture tender, melting ; flavor rich and sweet.

QUALITY : very good for dessert ; fair for cooking.

VALUE : market second-class.

SEASON : mid July.

## DYEHOUSE.

An early Morello cherry, ripening just in advance of Early Richmond, to which it is quite similar.

ORIGIN : Central Kentucky ; an accidental seedling in the orchard of Mr. Dyehouse.

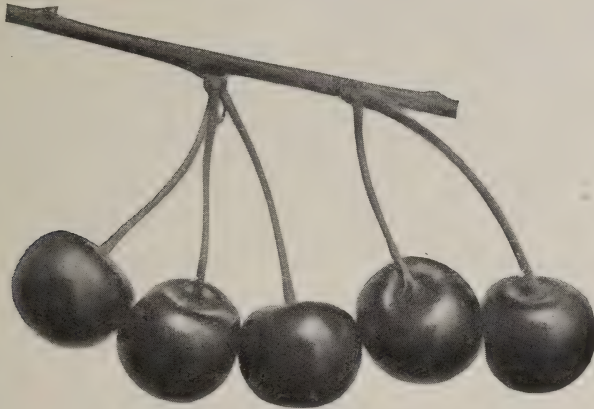
TREE : an early and abundant bearer ; habit round, spreading head, slender ; fairly vigorous ; not as hardy as Richmond ; class Kentish.

FRUIT : medium size, 9-16 x 11-16 of an inch ; roundish oblate ; apex depressed ; stem half inch long, rather stout, set in a large cavity ; color light red.

FLESH : pale yellow ; fairly firm ; juicy ; flavor acid.

QUALITY : dessert poor ; cooking first class.

SEASON : early July.



DYEHOUSE.

EARLY PURPLE. (*Early Purple Guigne.*)

The earliest cherry is the Early Purple, a foreign variety known in France as the Early Purple Guigne. The tree is a vigorous, upright grower, and becomes quite productive as it acquires age. Frequently the birds destroy the fruit before it matures, and if gathered as soon as colored red, it is little more than "skin and bones." The last few days of growth, the fruit fills out wonderfully, and then becomes almost a so-called "black cherry." Not usually profitable.

TREE : upright, vigorous, healthy ; productive when full grown.

FRUIT : medium size ; roundish heart-shaped ; skin dark red to purple ; stem two inches long in a shallow cavity ; suture obscure.

FLESH : red to purple ; texture tender, juicy ; flavor sweet and pleasant.

QUALITY : dessert good.

VALUE : market second class.

SEASON ; mid June.

ADAPTATION : grown at Maplehurst for thirty years and quite hardy ; recommended for trial north of Lake Ontario.



EAGLE. (*Black Eagle*.)

A very excellent dessert cherry, well deserving a place in the home garden, but not sufficiently productive to be recommended for the commercial orchard. The average annual yield of large trees at Maplehurst is from twenty-five to thirty quarts. The fruit is usually in scattered clusters, and often borne singly, making the gathering expensive. In England this variety is more productive than in Canada.

ORIGIN : England, 1810, by Miss E. Knight, of Downton Castle, from Bigaureau and May Duke.

TREE : second rate in vigor, of a round spreading habit ; third rate in productiveness ; group, Bigaureau.

FRUIT : medium to large, averaging about  $\frac{13}{16}$  long by  $\frac{11}{16}$  of an inch wide ; form obtuse heart-shaped, almost roundish oblate ; skin dark red, becoming almost black ; stalk slender,  $\frac{1}{2}$  to  $1\frac{1}{4}$  inches long in a medium cavity ; suture obsolete ; stone small.

FLESH : dark purple ; texture tender and juicy ; flavor very sweet, rich and delicious.

QUALITY : very good for dessert.

VALUE : first class for near markets ; second rate for distant markets because it soon decays.

SEASON : mid July.



BLACK EAGLE. (Reduced).

## ELTON.

An excellent dessert cherry for the garden, but too soft and too much inclined to rot, to be worthy of a place in the commercial orchard.

ORIGIN : England.

TREE : a vigorous grower ; upright in habit ; quite productive.

FRUIT : medium to large ; color pale yellow with red blush ; stem two inches long set in a deep cavity.

FLESH : light yellow ; texture delicate, tender, moderately juicy ; flavor sweet, vinous, delicious.

QUALITY : dessert good ; cooking fair.

VALUE : fair, but like most white cherries, not popular in the market, because inclined to show the slightest bruises.

SEASON : early July.



ELTON.

## GRENNER GLAS.

TREE : upright ; fruit in clusters ; vigorous ; moderately productive.

FRUIT : large in size,  $\frac{5}{8}$  x  $\frac{7}{8}$  ; form oblate, one sided ; color bright red ; cavity broad, shallow ; stem  $1\frac{1}{4}$  inches in length ; apex is a small depression ; suture traceable on one side.

FLESH : color yellowish with colorless juice ; texture tender ; very juicy ; flavor tart.

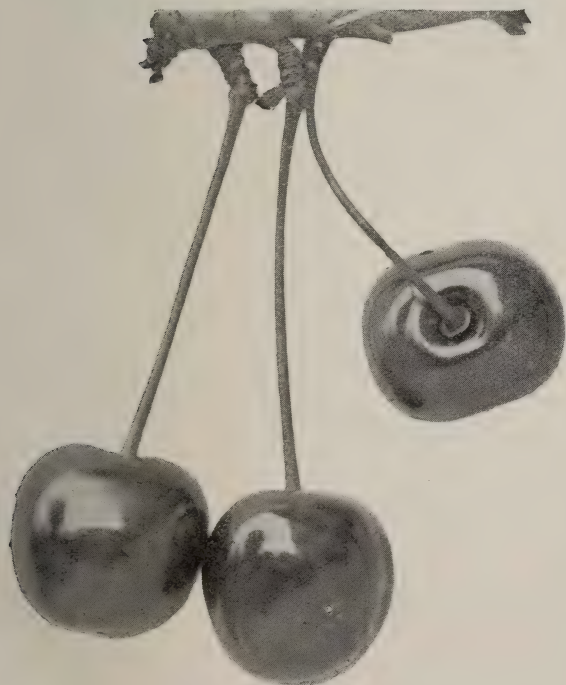
QUALITY : dessert poor ; cooking very good.

VALUE : market first class.

SEASON : mid July.

HORTENSE. (*Reine Hortense.*)

One of the finest flavored of cooking cherries, and one which deserves the first place in the home garden. It is not as productive as the May Duke, but from its habit of fruiting singly is less subject to rot than that excellent variety.



HORTENSE.

ORIGIN : France, in 1832, by M. Larose, Neuilly : first fruited in 1838.

TREE : of somewhat spreading habit, a vigorous and handsome grower and fairly productive ; group, Duke.

FRUIT : very large ; roundish elongated ; sides slightly compressed ; skin, thin, light shining red mottled with darker red, becoming richer in color the longer it hangs ; stalk slender, about two inches long.

FLESH : creamy yellow ; texture netted, very tender, juicy ; flavor slightly subacid, excellent.

QUALITY : very good for cooking ; very good for dessert.

VALUE : first to second class for market.

SEASON : mid July.



KNIGHT. (*Knight's Early Black.*)

A delicious early, black cherry, ripening about a week in advance of Black Tartarian. It is a regular and even bearer. The fruit is borne singly, or, occasionally, in pairs, and therefore is not gathered as rapidly as those varieties which grow in clusters. It is one of the most valuable dessert cherries, but not so productive as the Tartarian.

ORIGIN: England, by T. A. Knight, in 1810, from Bigarreau crossed with May Duke.

TREE: healthy, fairly vigorous, with spreading head; second rate in productiveness; group, Heart.

FRUIT: medium to large; form obtuse, heart-shaped, uneven; skin dark red or purple, becoming almost black if allowed to hang; stalk two inches long in a rather large cavity.

FLESH: dark red to purple; texture tender and juicy, but firmer than Tartarian; flavor sweet, rich and delicious; stone small.

QUALITY: very good for all purposes.

VALUE: for market first class.

SEASON: late June.



KNIGHT.

KOSLOV. (*Koslov Morello.*)

A valuable dwarf growing cherry of the Morello class, which is extremely hardy, and promises to be of the greatest value in the cold sections of Ontario.

ORIGIN: fifty trees of this variety were imported from Jaroslav Niemetz of Winnitza Podolie, Russia, in 1889 by Mr. Linus Woolverton, then Secretary of the Ontario Fruit Growers' Association, and by him distributed among the directors, and a few sent to Dr. Wm. Saunders of the Central Experimental Farm, Ottawa.

TREE: habit bush form, very slow of growth, might be planted six feet apart in a field and cultivated two ways; very hardy, Niemetz says it has endured a temperature of 46 degrees below zero in Russia; very productive.

FRUIT: fairly large; form roundish; color dark red, turning black at maturity; stalk one and a half inches long, set in a slight depression; suture traceable.

FLESH: red, turning dark red at maturity; texture tender, juicy; flavor mild acid.

QUALITY: cooking good.

VALUE: almost first class.

SEASON: early August.

LATE DUKE (*Anglaise Tardive.*)

A most desirable cooking cherry, because of its mild agreeable acid; and one of the most profitable of the Dukes, because (1) of its productiveness, and (2) of its season, which is between the Early Richmond and Montmorency. This and May Duke, which precedes it about two weeks, cover the early part of the season for cooking purposes; while Montmorency (Kentish) and English Morello extend the season of cooking cherries to the 1st of August.

TREE: habit upright; very vigorous and very productive; group, Duke.

FRUIT: large of its class,  $\frac{3}{4} \times \frac{3}{4}$  of an inch; form roundish, slightly flattened; color partly covered with bright red, but rich, dark red when fully ripe; stalk  $1\frac{1}{2}$  inches long, inserted in a shallow cavity; suture traceable; flesh creamy white, tender and juicy; flavor very mild, agreeable acid.

QUALITY:  
good for  
dessert;  
best for  
cooking.

SEASON:  
mid July.



LATE DUKE.

MAGNIFIQUE. (*Belle Magnifique.*)

Chiefly valuable for its lateness of ripening.

ORIGIN: France.

TREE: upright round habit; vigor moderate; not very productive; Duke.

FRUIT: about  $\frac{3}{4}$  of an inch long by  $\frac{7}{8}$  broad; form heart shape, flattened, obtuse; color bright red; stem about two inches long, set in a large broad cavity; suture traceable.

FLESH: color light yellow; juice uncolored; texture tender, juicy; flavor sub-acid.

QUALITY: dessert poor; cooking good.

VALUE: market second class.

SEASON: late July.



MAGNIFIQUE.



MAY DUKE. (*Early Duke, Royal Hatire.*)

A fine cooking cherry. The great productiveness, health and vigor of the tree, the mild acid of the fruit ripening over a considerable season, all tend to make this a favorite variety. The fruit is rather tender for distant shipments, and inclined to rot in wet seasons. These Duke cherries have green and ripe fruit at the same time, which makes them undesirable for commercial orcharding, as it necessitates several pickings instead of one, increasing the cost of harvest beyond the margin of profit.

ORIGIN : Medoc, a Province in France, from whence the name is said to be a corruption.

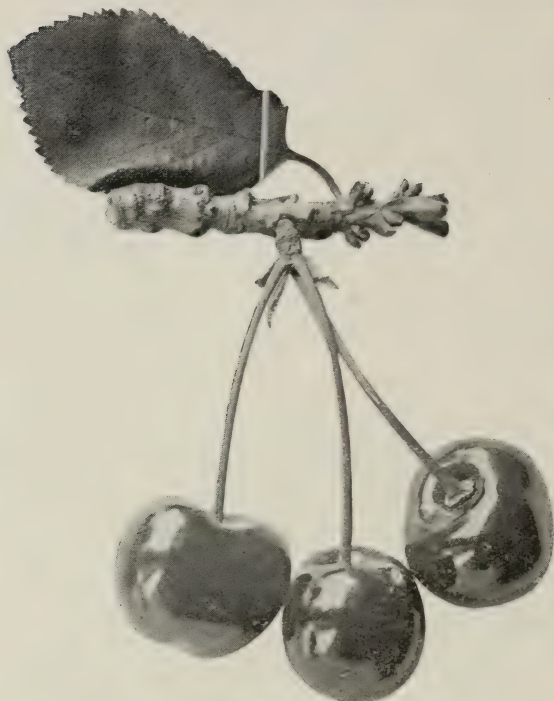
TREE : upright, a habit especially noticeable in young trees ; vigorous, hardy and productive ; group, Duke.

FRUIT : size small to medium ; form roundish, obtuse, heart-shaped, with traceable suture and distinct indentation to apex ; grows in clusters ; skin bright red, turning darker at full maturity ; stalk  $1\frac{1}{2}$  to 2 inches long ; stone small.

FLESH : red ; texture tender, very juicy ; flavor subacid, and very good.

QUALITY : good for dessert, first class for cooking.

SEASON : late June.



MAY DUKE.

MEZEL.—(*Monstreuse de Mezel, Bigarreau of Mezel.*)

One of the finest of the late black cherries, of large size and great productiveness. Though a Bigarreau it has not the fault of its class of being especially subject to rot ; it is not so black in color as the Elkhorn, but dark enough a red to be classed with the black cherries.

ORIGIN : Mezel, France ; first introduced in 1846.

TREE : upright, spreading, a very vigorous grower ; one tree at Maplehurst forty years planted was thirty feet in height in 1897, and covered an area about the same number of feet in diameter ; first rate in hardiness and in productiveness ; group, Bigarreau.

FRUIT : very large, fifteen-sixteenths of an inch long by one inch in width ; form obtuse, heart shaped, slightly flattened, with a clearly-defined suture on one side, ending in a slight nipple ; skin dark red at first, changing to dark purple at maturity ; stalk two inches long, slender, set in good sized cavity.

FLESH : firm, juicy, breaking ; flavor sweet, good.

QUALITY : for dessert very good.

VALUE : for market first class.

SEASON : mid July.



MEZEL.

## MONTMORENCY.

Of all the Morello cherries this seems to us the most profitable. The tree is one of the most vigorous in its class, the fruit being large and abundant. This and the Early Richmond cover the season very well, and are the two leading Kentish varieties for market. In France this cherry has many synonyms, as, for example, Montmorency, a longue queue, Petit-Gobet, etc.

ORIGIN: Montmorency valley in France in middle of 17th century.

TREE: hardy, healthy, fairly vigorous, very productive and an early bearer.

FRUIT: attached in ones and twos; size  $\frac{3}{4}$  long by  $\frac{1}{2}$  inch broad; form roundish, almost flattened at apex; skin bright shiny red, becoming darker at maturity, easily detached from the flesh; stem  $1\frac{1}{2}$  inches long, in a rather large cavity.

FLESH: pinkish yellow, tender, very juicy, sprightly acid.

QUALITY: very good for cooking.

VALUE: for market first class.

SEASON: mid July.

ADAPTATION: general over the Province.



MONTMORENCY.

MORELLO.—(*English Morello*.)

An old reliable variety for cooking purposes, known in England for nearly three hundred years, and deserving of wider cultivation in Ontario. Downing thinks the name Morello is from *Morus*, the Mulberry, from the dark purple color of its juice, which resembles that of the mulberry; a profitable market variety.

TREE: habit spreading, slender, hardy and very productive; vigor medium; group, Morello.

FRUIT: fairly large, roundish, nearly heart shaped, somewhat flattened on one side, with a slightly traceable suture.

SKIN: red, turning dark red or purple towards maturity; stalk about  $1\frac{1}{2}$  inches long, inserted in a shallow cavity; stone small, slightly cling.

FLESH: very dark red; texture tender, juicy; flavor acid, becoming more sub-acid and agreeable the more it matures.

QUALITY: dessert very poor, cooking first-class.

VALUE: home market second class.

SEASON: early August.



MORELLO.



NAPOLEON. (*Napoleon Bigarreau, Royal Anne of California.*)

A valuable variety of foreign origin. Perhaps the most productive variety known, yielding fruit of the very largest size which is in good demand and, therefore, one of the most desirable for the commercial orchard. It has one serious fault, namely, it is very subject to the rot, especially in wet seasons, and sometimes the whole crop of this variety is ruined by it.

TREE: upright, spreading, vigorous, hardy on the south shore of Lake Ontario; very productive.

FRUIT: very large, oblong heart shaped; skin yellow ground, light in shade, rich red cheek in the sun, sometimes mottled; stem  $1\frac{1}{2}$  inches long; suture plainly traceable.

FLESH: yellowish white, very firm, meaty, fairly juicy; flavor good; texture much esteemed for canning because it looks well in the jars and bears cooking well.

QUALITY: dessert medium.

VALUE: market first class.

SEASON: early July.



NAPOLEON.

OREL 25.

One of the hardiest of the Morello cherries; reported upon favorably by our northern stations, and considered by Mr. Jones, of our St. Lawrence station, the best all round cherry yet tested for cold sections.

ORIGIN: Russia; imported by Prof. Budd in 1883.

TREE: rather a slow grower; an early and abundant bearer; habit round spreading head.



OREL.

FRUIT: medium size,  $\frac{5}{8}$  x  $\frac{7}{8}$  of an inch; form roundish; color carmine; stem one and a quarter to one and a half inches in a round cavity; apex a distinct depression; suture partly traceable.

FLESH: color yellowish; texture tender, juicy; juice uncolored; flavor mild subacid.

QUALITY: dessert poor; cooking good.

VALUE: market first class

SEASON: mid July.

ADAPTATION: one of the hardiest varieties.

## OLIVET.

From tests in the experimental orchard, we judge the Olivet to be a valuable variety for the home garden. The tree is a fine grower, and the fruit large and attractive, with a mild acid flavor, while in season it immediately succeeds the Reine Hortense.

TREE: of French origin, usually classed with the Dukes, fairly vigorous; hardy; productiveness second rate

FRUIT: large,  $\frac{3}{4}$  by  $\frac{7}{8}$ , obtuse, heart-shaped, almost round; color dark rich carmine; stem 1 to  $1\frac{1}{2}$  inches long in a broad cavity, often in pairs.

FLESH: reddish; texture soft, melting, very juicy; juice stains red; flavor very mild, pleasant acid.

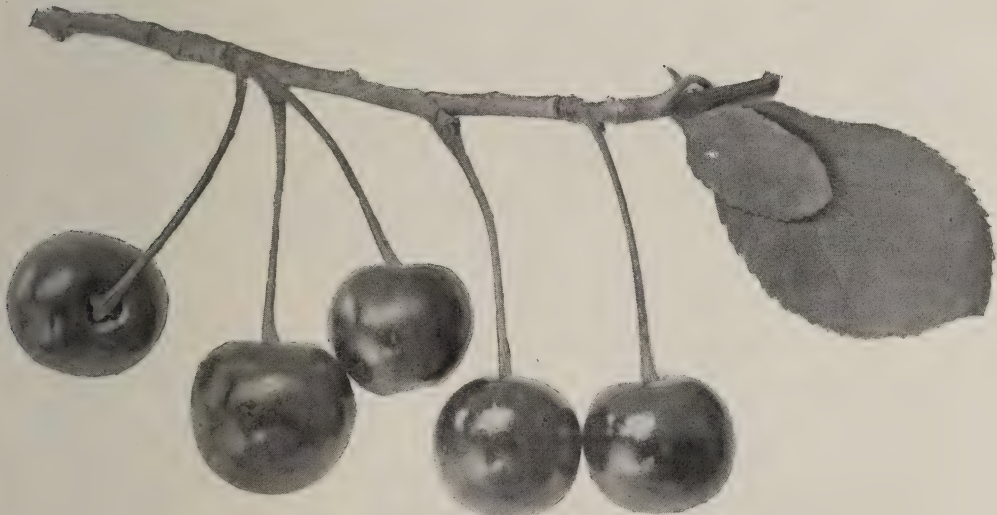
QUALITY: dessert fair, cooking very good to first-class.

VALUE: not yet determined in Ontario.

SEASON: early July.

OSTHEIM.—(*Griotte d'Ostheim.*)

This Morello cherry was distributed throughout the Province by the Ontario Fruit Growers' Association. The fruit is of fair size, productive enough to be profitable, and good for all purposes. Its hardiness should make it a special favorite in the colder sections to succeed the Montmorency.



OSTHEIM.

ORIGIN: South of Spain, brought to Germany early in the 18th Century, and cultivated near Ostheim, Saxe-Weimar, whence its name.

TREE: third rate in vigor, almost a dwarf; first in hardiness, and second rate in productiveness; group, Morello.

FRUIT: medium, about  $\frac{9}{10}$  x  $1\frac{3}{8}$  of an inch in length and breadth. The variety must vary, since Dr. Hogg describes it as large, and LeRo describes the stalk two inches long, set in a pronounced cavity; form round, slightly depressed at the side; color very dark purple, almost black when ripe; stalk one and three eighths inches; suture not traceable; pit small, cling.

FLESH: color very dark purple, texture tender, juicy, almost sweet when ripe, agreeable.

QUALITY: poor for dessert, fair for cooking.

VALUE: for market third class.

SEASON: late July.

ADAPTATION: quite general; found fruiting freely in St. Joseph's Island, Algoma.



OHIO (*Ohio Beauty*).

A sweet cherry, succeeding Wood ; not subject to rot

ORIGIN : Ohio.

TREE : habit upright ; vigorous producer ; class Heart.

FRUIT : size large,  $\frac{1\frac{1}{2}}{2}$  x  $\frac{1\frac{3}{4}}{2}$  ; form heartshaped ; stalk one and a half inches long, slender in a moderately deep, somewhat irregular cavity ; color light yellow, nearly overspread with light and dark shades of bright red.

FLESH : color yellowish white ; texture tender, meaty, somewhat juicy ; flavor sweet, very pleasant.

QUALITY : dessert very good ; cooking fair.

VALUE : market second class compared with black oxhearts.

SEASON : early to mid July.

## PURITY.

A remarkably fine Morello cherry, ripening slightly in advance of the Early Richmond, and very productive. It closely resembles Dyehouse.

TREE : fairly vigorous, healthy and productive ; an early bearer.

FRUIT : size fair,  $\frac{3}{8}$  x  $\frac{3}{4}$  of an inch ; form roundish ; color very dark red ; stem long,  $1\frac{1}{2}$  to 2 inches long, set in a deep cavity ; apex much depressed ; pit small.

FLESH : color yellowish ; texture tender ; very juicy ; flavor subacid ; pleasant.

QUALITY : dessert fair ; cooking very good to best.

VALUE : market first class.

SEASON : late June to early July.

PLYMOUTH (*Plymouth Rock*).

A valuable white Bigarreau because not subject to rot, and a fine shipper.

ORIGIN : Connecticut.

TREE : vigorous ; very productive ; an early bearer.

FRUIT : medium,  $\frac{3}{4}$  x  $\frac{3}{4}$  of an inch ; heart shaped ; color bright red in sun on yellowish ground ; stem  $1\frac{3}{8}$  inches long in a one-sided cavity.

FLESH : yellow ; texture tender, meaty, moderately juicy ; flavor sweet, rich, excellent.

QUALITY : very good for dessert.

VALUE : market second class.

SEASON : mid July.

RICHMOND (*Early Richmond*).

(*Virginian May ; Kentish Pie of Hogg ; Native of LeRoy.*)

This Morello cherry appears to be of French origin, and George Lindley supposed that it had been brought into England from Flanders in the reign of Henry III.

TREE : slow grower, slender in branch ; very hardy ; very productive in proportion to its size.



RICHMOND.

FRUIT : Below medium, free from rot and not very subject to curculio ; form almost round, though slightly flattened ; skin uniformly of a bright red becoming darker as it matures ; stem slender, about one inch in length, often carrying the calyx, inserted in a good sized cavity ; apex set in a small indentation.

FLESH : very tender in texture ; yellowish with abundant uncolored juice ; flavor quite acid ; pit small.

QUALITY : poor for dessert, but first class for all culinary purposes.

VALUE : very good for market.

SEASON : early to mid July.

ADAPTATION : succeeds wherever cherries are grown in the Province.

## ROCKPORT.

A Bigarreau originated by Prof. Kirkland, of Cleveland, Ohio. Its season of ripening is about the same as Governor Wood, but it is a heavier bearer of fruit, about the same size and less highly colored. It would be profitable were it not so subject to rot, but nearly every year we have lost a large portion of the crop of this variety at Maplehurst from this cause. Like the other Bigarreaus, it is too firm a cherry to be a favorite with the birds.

TREE : upright, spreading ; fairly vigorous ; very productive.

FRUIT : large, roundish, obtuse, heart-shaped ; skin amber nearly covered with bright red.

FLESH : pale yellow ; texture firm, juicy ; flavor sweet and good.

QUALITY : dessert or cooking good.

VALUE : market second class.

SEASON : late June.

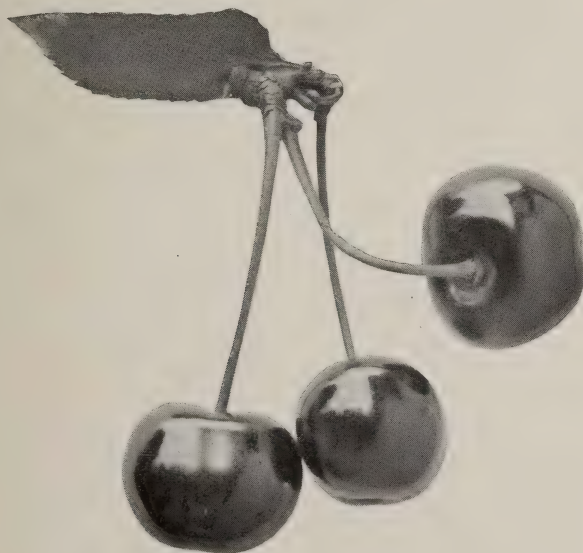
## ROYAL DUKE.

A fine pie cherry, but it ripens unevenly, and is inferior to the Late Duke both in quality and productiveness.

ORIGIN : France.

TREE : very upright ; vigorous ; fairly productive ; Duke.

FRUIT : medium size, half by three-quarters of an inch in diameter ; form roundish, heart shape ; color light red, crimson on sunny side ; stem one and a half inches long set in a round regular cavity ; apex a dimple.



ROYAL DUKE.

FLESH : flesh color ; texture moderately firm, juicy ; flavor subacid.

QUALITY : cooking good.

VALUE : market first class.

SEASON : early July.



### RUSSIAN MORELLO. (*Russian 207*).

A good cooking cherry.

ORIGIN: Rusia.

TREE: vigorous; productive.

FRUIT: small,  $\frac{1}{2}$  inch long by  $\frac{5}{8}$  wide; roundish in form; color dark red; stem two inches long in a shallow cavity.



RUSSIAN MORELLO.

FLESH: color red with colored juice; texture tender, moderately juicy, semi-cling; flavor ordinary.

QUALITY: dessert useless; cooking good.

VALUE: market second class.

SEASON: mid July.

### SCHMIDTZ (*Schmidtz' Bigarreau*).

A magnificent cherry, but so far not sufficiently productive.

TREE: upright; very vigorous; not very productive; group, Bigarreau.

FRUIT: very large; form obtuse, heart-shaped; color dull red, mottled with rich red; stem  $1\frac{1}{4}$  inch long in a large cavity; suture slight.

FLESH: color reddish; texture firm, moderately juicy, flavor sweet and rich.

QUALITY: first-class for dessert.

VALUE: market, first-class.

SEASON: late July.

### SPANISH (*Yellow Spanish*).

Of the Bigarreau cherries this is one of the finest, both on account of its great size and its delicious flavor. The tree grows to a very large size, surpassing in this respect any other cultivated variety with which we are acquainted. It does not average very productive, because the fruit often blasts and drops, or is destroyed by Monilia. When, however, it does mature a good crop, the yield is enormous.

The variety is of European origin, and was introduced into the United States in 1800.

TREE: very vigorous, of large growth; habit, spreading, fairly productive.

FRUIT: very large and of a beautifully waxy lustre; form round, obtuse, heartshaped; skin clear amber, nearly covered with red when exposed to the sun; stem stout,  $1\frac{1}{2}$  inches long in a wide cavity; suture traceable.

FLESH: pale yellow; texture firm, juicy, breaking; flavor sweet, delicious when well ripened.

QUALITY: dessert very good; cooking or canning, very good.

SEASON: early July.

VALUE: market first class.

SUDA (*Suda Hardy*).

A fine Morello cherry, but of about the same season as the Montmorency and hardly as productive.

ORIGIN : Missouri.

TREE : habits round head, Kentish ; fairly vigorous, very hardy ; productive.

FRUIT : size  $\frac{7}{8}$  of an inch in diameter ; form roundish, slightly flattened ; color red ; stem  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches long set in a regular cavity : apex very slight ; suture barely traceable.

FLESH : yellowish white ; texture soft, tender, juicy ; flavor tart.

QUALITY : dessert useless ; cooking very good.

VALUE : market almost first-class.

SEASON : mid July.

TARTARIAN. (*Black Tartarian*.)

Of black cherries this is one of the choicest, whether for market or for dessert on the home table. Of large size and delicious flavor, it is relished by all cherry lovers, and, being somewhat soft fleshed, it is very subject to the ravages of birds ; it is also subject to rot in wet seasons. On this account it is often necessary to harvest and ship it a little on the green side. It is not so productive as some others, but it makes up for this by bringing a higher price.

ORIGIN : Russia and Western Asia, introduced into England in 1796, and thence to America.



TREE : erect, vigorous, attaining large size ; fairly productive ; group, Heart.

FRUIT : very large,  $\frac{7}{8}$  x 1 inch, heart-shaped, of somewhat irregular outline ; stem  $1\frac{3}{4}$  inches long ; skin bright purplish black.

FLESH : dark purple, tender and juicy ; flavor rich and delicious.

QUALITY : dessert very good.

VALUE : market first class.

SEASON : early July.

ADAPTATION : south of Lake Ontario, and in sheltered places a little further north.



## WINDSOR.

A valuable late cherry for either home use or market, its firm flesh making it a better shipper than most dark colored cherries. Indeed, from the middle to the end of July, when this cherry is at its best, there is no other to compete with it, the Elkhorn being just over. The tree is not an early bearer, and the fruit is very subject to the rot in some locations and needs thorough spraying with Bordeaux to prevent this fungus.

ORIGIN: by James Dougall, Windsor, Ontario.

TREE: a vigorous, upright, symmetrical grower, healthy, very hardy and productive.

FRUIT: large,  $1\frac{1}{2}$  inch long by 1 inch wide; form round, obtuse, heart-shaped; color dark red turning darker as it hangs; stem  $1\frac{1}{2}$  inches long, set in a moderately deep cavity; in twos and threes; suture obscure.

FLESH: yellowish, with reddish tint; texture firm, moderately juicy; flavor rich and sweet.

QUALITY: dessert very good; cooking poor.

VALUE: first class.

SEASON: late July.

ADAPTATION: farther north than most Bigarneau cherries.



WINDSOR.

WOOD. (*Governor Wood*.)

This variety has proved itself a most satisfactory cherry for both dessert and market purposes. It is a very productive variety, and, though somewhat tender in flesh, is not nearly so subject to ravages by birds as Early Purple or Tartarian. Originated by Prof. Kirtland, of Cleveland, Ohio, U.S.A.

TREE: upright, spreading, healthy, vigorous and hardy wherever the peach succeeds.

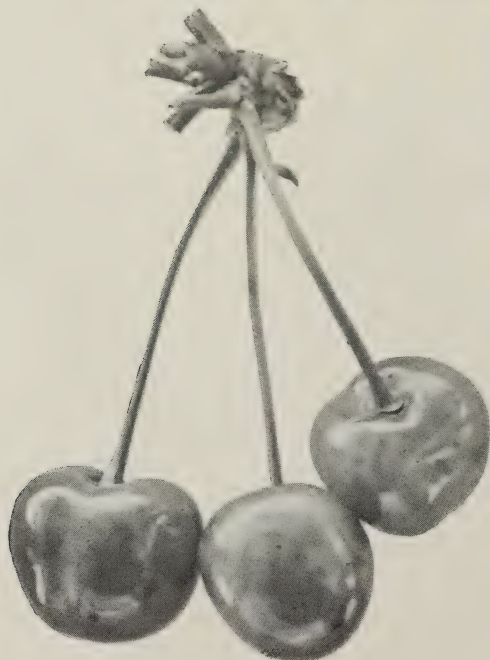
FRUIT: medium to large  $\frac{3}{4}$  to  $\frac{7}{8}$  of an inch in length and breadth respectively; form roundish-heartshaped; skin light yellow, shaded with light to deep red; stem  $1\frac{1}{2}$  to  $1\frac{3}{4}$  inches long in a broad deep cavity; suture distinct on one side.

FLESH: yellowish; texture tender, juicy; flavor sweet, aromatic and delicious.

QUALITY: dessert, very good.

VALUE: market, first and second class.

SEASON: late June.



WOOD.

## THE PEACH.

The peach is the tenderest of the large fruits grown in Ontario, and the fact that it can be grown so successfully in some parts of the Province has done much to dissipate the idea which at one time prevailed in the United States and abroad that the climate of Ontario was too severe for anything but the hardiest fruits.

The district in Ontario where the peach succeeds best is the Niagara Peninsula, where Lake Ontario and Lake Erie do much to ameliorate the climate and prevent in a large measure the extremes in temperature which are fatal to peach culture. In the Essex Peninsula, or the extreme south-western part of the Province, the peach also succeeds well, but has in the past been more subject to root killing in winter. This may probably be guarded against in the future by the more general use of cover crops.

The peach also does fairly well where the soil is suitable all along the Lake Erie shore, the most favorable locations, however, being within four or five miles of the water. During recent years it has been found that the peach will thrive along the shore of Nottawasaga Bay, which is known as the Georgian Bay district, but up to the present time only a limited number of trees have been planted. It is still doubtful if peaches will ever be grown there to any extent commercially.

Peaches are raised for home use all over the western part of the Province with varying degrees of success, depending on the protection afforded and the soil, but where the temperature falls much more than 10 degrees Fahr. below zero success is very uncertain. Probably the extreme northern limit where peaches have been produced in the open is at Orillia, though the trees lived but a few years. They have been grown as far east as the city of Belleville, and perhaps further.

The market for the best peaches is good, and the peach where it can be grown successfully is one of the most profitable fruits.

As the peach is a tender fruit and the trees suffer when there are extremes of temperature, and at certain seasons when there are light frosts, great judgment should be shown in choosing a site for the orchard. Where possible, a site should be chosen with an exposure facing the water. If a northern exposure is available and the site is suitable in other ways it should be utilized, as often great injury is done by spring frosts when the buds are swelling, and buds will not expand as rapidly on a northern slope as on a southern. A site where local frosts are known to occur should be avoided.

While the situation for the peach orchard is important, a site will avail little if the soil is not suitable. The soil should be as near as possible a rich warm sandy loam with an open gravelly subsoil affording perfect drainage. Orchards are occasionally found thriving on heavier soils, but success is less certain on the heavier lands. The soil should be thoroughly prepared as recommended for the apple, and no fruit will respond better to thorough tillage than the peach.

Trees one year from the bud are the best kind to plant. They should be thrifty and free from insects and disease. The best time to plant is early in the spring, although fall planting is sometimes successful. Peach trees are planted from fourteen to twenty feet apart, depending upon the system of pruning which is followed. The former distance is adopted only when severe heading back is practised, otherwise the trees would soon become too crowded. For general culture the best distance is from eighteen to twenty feet apart each way. When planting, some of the best growers remove all of the side branches, leaving a mere whip, while others cut the side branches back to within one or two buds of the main stem. The advantage gained by the latter method is the tree is stronger at the crotches and not quite so liable to split down with weight of crop. Whatever plan is adopted, the tree should be pruned back severely when set. Peaches are



usually headed lower than other large fruits, from two to three feet from the ground being the usual distance at which the head is started. For the first two or three years pruning should be carefully done in order to get a well balanced top with four or five strong branches, avoiding bad crotches. In order to keep the tree within bounds, severe heading back is necessary until the trees come into full bearing, the usual practice being to head back from one-half to two-thirds of the previous year's growth every spring, at the same time removing altogether branches which will make the top too crowded. The object is to have a tree which will bear fruit all through the head instead of merely on the outside or at the top of the tree.

The low heading of peach trees is rapidly gaining in popularity with peach growers. By this system the tree has very little bare trunk, the lowest branches starting from near the ground, while the highest is not more than eighteen inches. The trees are kept severely headed back especially at the top, the result being that much stockier trees are formed. The advantages of this system are that the fruit is picked easier, that there is more bearing wood, that there is less injury from wind, and that the trees can be sprayed to greater advantage.

The cultivation of peach orchards should be very thorough to produce vigorous growth, as the proportion of strong new growth which is made, regulates to a large extent the size of the crop, for peaches, unlike most other large fruits, are borne on the wood made the previous year.

Cover crops are very desirable in peach orchards, as the peach soils are usually deficient in humus which cover crops supply, and the latter protect the roots of the trees in winter, thus lessening the danger from root killing. As peach trees when in full bearing draw heavily on the potash in the soil, a good application of unleached ashes every two or three years is beneficial, and muriate of potash and bone meal applied at the rate of about 200 pounds per acre each, annually should do much good, especially when barnyard manure cannot be obtained.

Where it can be managed, it usually pays well to thin peaches on the tree. This is done when they are about the size of small hickory nuts, the peaches being left from four to six and even eight inches apart on the branches.

It requires judgment to know just when to pick a peach, as much will depend upon the distance it is to be shipped. When intended for immediate consumption, no one is likely to pick a peach until it is ready to eat, but for a distant market it must be still firm, though well colored. Fruit which is picked on the green side never attains its full flavor and unfortunately much fruit of this class reaches the market, and it undoubtedly lessens the consumption of this fine fruit. Bruising of peaches should be avoided, hence great care should be taken in handling them.

#### VARIETIES RECOMMENDED.

##### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

##### *Commercial:*

*Sneed:* Whitefleshed, clingstone, quality only fair, earliest of all.

*Alexander:* Whitefleshed, clingstone.

*Hynes:* Whitefleshed, semi-cling, quality good.

*St. John:* Yellowfleshed, freestone, quality good.

*Mountain Rose:* Whitefleshed, freestone, quality very good.

*Early Crawford:* Yellowfleshed, freestone, quality very good.

*Champion:* Whitefleshed, freestone, quality very good, for home use, or near markets.

*Brigdon:* Yellowfleshed, freestone, quality good.

*Fitzgerald:* Yellowfleshed, freestone, quality very good.

*Reeves:* Yellowfleshed, freestone, quality fair, large size.

*Elberta:* Yellowfleshed, freestone, quality fair, good for long distance shipments.

*Oldmixon*: Whitefleshed, freestone, quality good.

*Stevens*: Whitefleshed, freestone, quality good.

*Smock*: Yellowfleshed, freestone, quality fair, very late, good shipper.

*Domestic*:

Hynes, St. John, Early Crawford, Oldmixon, Longhurst, Stevens.

#### DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Niagara District*: By Linus Woolverton, Grimsby, Ont.

*Commercial*: Sneed, Alexander, Greensboro, St. John, Early Crawford, New Prolific, Champion, Elberta, Willett, Smock.

*Domestic*: Rivers, Hynes, St. John, Early Michigan, Lewis, Crosby, Champion, Reeves, Wonderful, Jacques Rareripe, Wheatland, Longhurst.

*Essex District*: By W. W. Hilborn, Leamington, Ont.

*Commercial*: Alexander, St. John, Brigdon, Early Crawford, Fitzgerald, New Prolific, Engol, Elberta, Golden Drop, Kalamazoo, Banner, Smock.

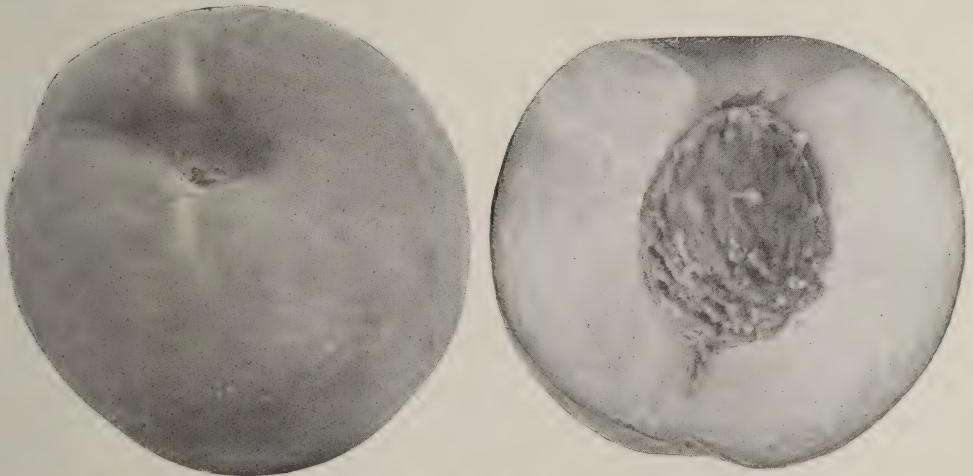
*Domestic* (Whiteflesh): Alexander, Mountain Rose, Oldmixon, Stevens.

(Yellowflesh): St. John, Early Crawford, Fitzgerald, New Prolific, Engol, Crosby, Golden Drop, Banner.

## DESCRIPTION OF VARIETIES.

### ALEXANDER.

An early variety considerably grown in the Niagara district and in Essex County. It is a cing-tone of poor quality for dessert purposes and poor also for cooking, so that, in competition with better varieties coming in at the same time from southern orchards, it sells at a low price in our markets.



ALEXANDER.

ORIGIN : chance seedling, Mount Pulaski, Ill., on farm of A. O. Alexander.

TREE : vigorous ; hardy ; productive.

FRUIT : medium ; globular, sides unequal ; color greenish, suffused with dark and light red ; suture broad ; apex slightly sunken.

FLESH : color, greenish white ; texture, firm, juicy, half melting, clings to stone ; flavor, sweet and fairly good.

QUALITY : dessert poor ; cooking poor.

VALUE : market second class.

SEASON : early August.



## BANNER

A popular late market peach among the Essex fruit growers.

ORIGIN : Essex County, Ontario ; first fruited on a large scale in 1903.

TREE : hardy and productive.

FRUIT : medium to large ; round ; color yellow with red cheek, attractive.

FLESH : yellow ; texture, fine grained, moderately juicy ; flavor rich.

QUALITY : good.

VALUE : market first class

SEASON : early October.

BRIGDON (*Garfield*.)

BRIGDON.

A good commercial variety, of the Early Crawford class.

ORIGIN : New York State.

TREE : vigorous ; productive.

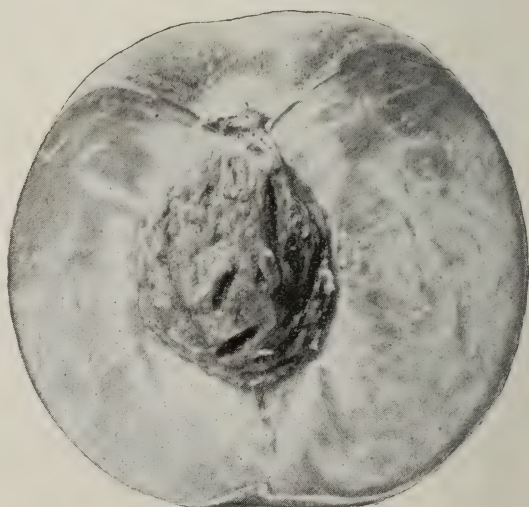
FRUIT : size, medium to large ; form, roundish oval ; color, yellow with red cheek ; suture traceable.

FLESH : free ; color yellow ; texture tender, very juicy ; flavor rich, vinous.

QUALITY : first-rate for all purposes.

VALUE : first class for market.

SEASON : late August to early September.



SECTION OF BRIGDON.

## BEERS SMOCK.

"Medium to large, round ; color creamy white dark red blush ; cavity quite deep ; suture distinct, flesh quite juicy, yellow, with red at pit, tender, rich ; quality good ; pit free. Origin, New Jersey." (*American Horticultural Manual.*)  
Not sufficiently tested in Ontario. Season mid October.

## BOWSLAUGH.

Esteemed for canning, but inferior in size to the Longhurst, which it closely resembles.

ORIGIN : Grimsby, Ontario, with Mr. Bowslaugh.

TREE : productive.

FRUIT : size small to medium ; color of skin, yellow with a dull red cheek ; suture traceable more than half way around ; cavity deep, irregular, apex prominent.

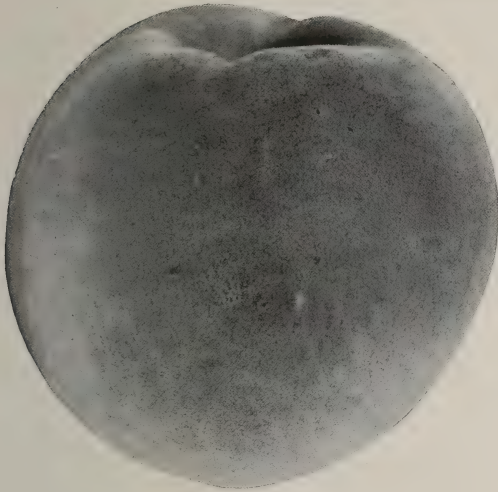
FLESH : free from pit ; yellow, pink at pit ; texture tender, not very juicy, lacking in flavor, neither sweet nor acid.

QUALITY : dessert poor ; cooking fair to good.

VALUE : market, second class.

SEASON : first half of October.

## CHAMPION.



CHAMPION.

A beautiful white fleshed peach with a red cheek, and free stone. The flavor is delicious, and it may be classed as the best dessert peach of its season, but a little tender for distant shipment.

ORIGIN : Illinois.

TREE : vigorous, moderately productive.

FRUIT : large ; form roundish, fairly regular ; color of skin, creamy white, with red cheek in the sun ; suture visible two-thirds of the circumference ; apex small in a slight depression ; cavity deep ; stone free.

FLESH : white, pinkish at the pit ; texture, fine, tender, juicy ; flavor, rich, sweet and agreeable.

QUALITY : dessert among the best.

VALUE : first-class for home markets, but rather tender for distant shipments.

SEASON : early September, coming in with last Yellow St. John and the first Early Crawfords.



SECTION OF CHAMPION.



CHILI (*Hill's Chili*).

Recommended for drying ; a good shipper.

ORIGIN : New York State.

TREE : fairly vigorous ; productive.

FRUIT : medium to large ; form roundish ovate : color pale yellow, with red cheek ; down thick, whitish ; cavity narrow, deep ; suture marked ; apex a point.

FLESH : light yellow tinted red at the pit ; texture tender, moderately juicy ; flavor sub-acid ; free.

QUALITY : dessert poor ; cooking good ; drying good.

VALUE : home market, second class.

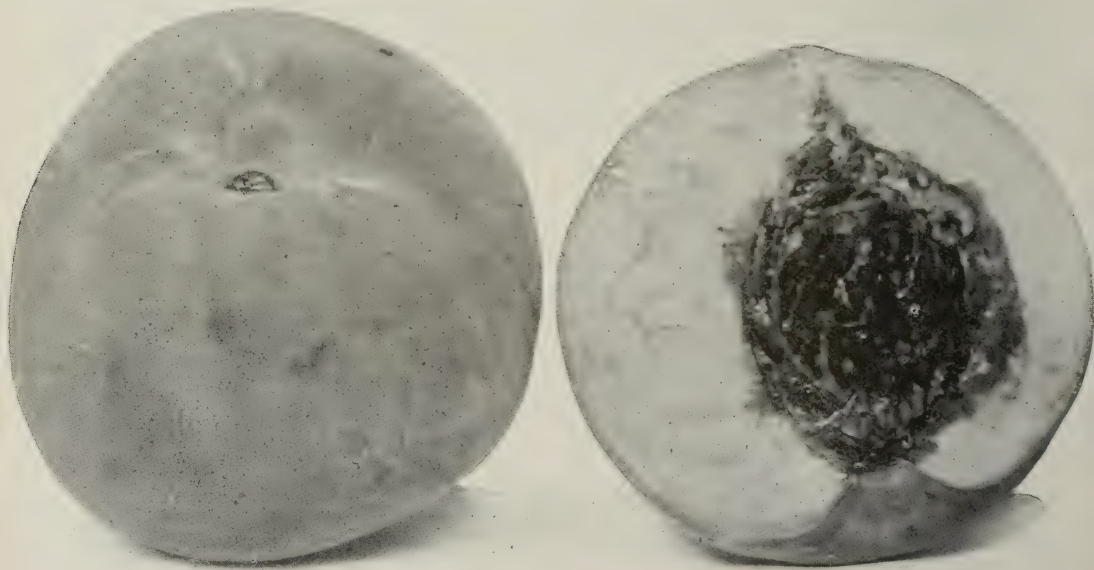
SEASON : mid September.

CROSBY (*Excelsior, Hale's Hardy*.)

A peach of good quality, but scarcely large enough for the commercial orchard.

ORIGIN : Massachusetts 1876, by Mr. Crosby, nurseryman ; named Excelsior by the Massachusetts Agricultural College ; Hale's Hardy, because Mr. J. H. Hale was the first grower to plant it extensively, and finally Crosby by the United States Division of Pomology.

TREE : vigorous ; healthy ; fairly hardy ; very productive.



CROSBY.

FRUIT : medium size ; form almost round, slightly one-sided ; color yellow, with bright red cheeks ; very pretty ; cavity, deep, abrupt ; apex small in a slight depression ; suture traceable.

FLESH : color, bright yellow, red at the stone ; texture, fine, moderately juicy, tender ; flavor, sweet and very agreeable.

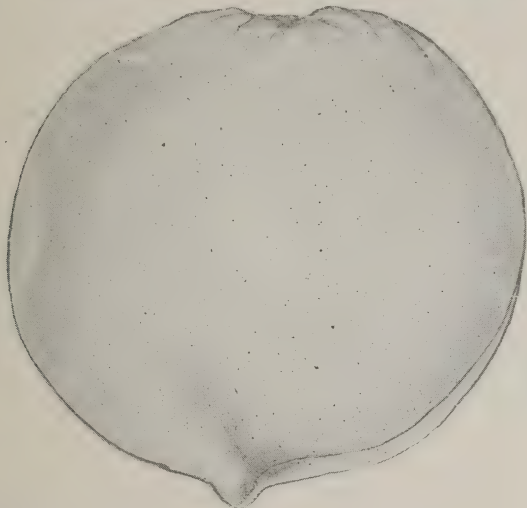
QUALITY : very good for dessert, and good for cooking.

VALUE : first class for home market.

SEASON : late September to early October.

## EARLY CRAWFORD.

Early Crawford has long held its place at the head of the list of peaches both for home use and for market. Its beautiful golden color, its large size, its free stone and rich flavor all unite in giving it a just claim to this position. Its buds are a little more tender than those of some other varieties, and, consequently, many growers hesitate to plant it, but where high cultivation and plenty of fertilizer is given, fine crops of luscious fruit have resulted.



EARLY CRAWFORD.

ORIGIN: Middleton, N.J., by Wm. Crawford.

TREE: vigorous; productive under favorable conditions; bloom not conspicuous.

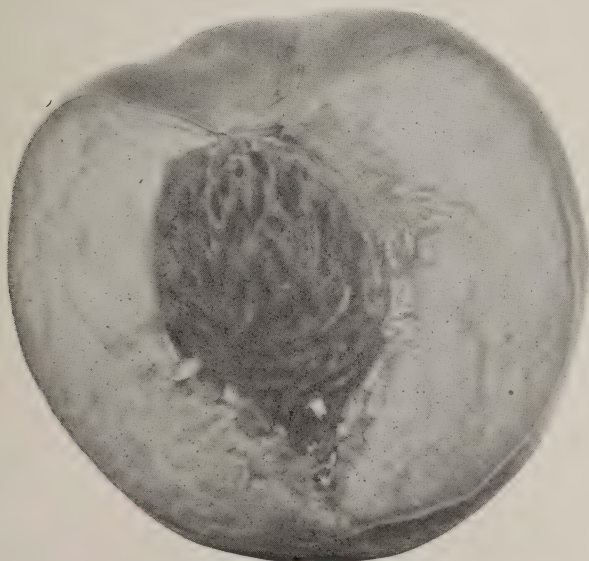
FRUIT: large to very large, oblong; suture shallow; apex prominent, swollen; color golden yellow, with rich red cheek.

FLESH: color, yellow; flavor, sweet, rich; free from stone, which often parts in middle when nearly ripe.

QUALITY: dessert and cooking, very good.

VALUE: first class for market.

SEASON: early September.



SECTION EARLY CRAWFORD.



## EARLY MICHIGAN.



EARLY MICHIGAN

A very good dessert peach.

ORIGIN : Georgia.

TREE : healthy, vigorous and productive.

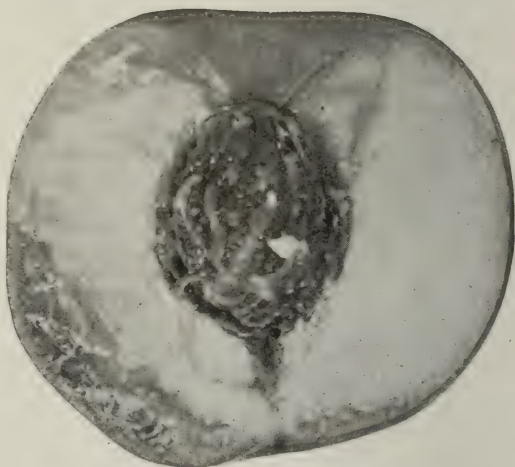
FRUIT : medium size, wide, form round ; color, cream or greenish white ground nearly covered with crimson ; cavity, large and deep ; suture very distinct from cavity to apex and beyond ; pit a clingstone.

FLESH : greenish white, red at pit ; texture tender and juicy ; flavor, subacid, very pleasant.

QUALITY : dessert very good.

VALUE : market second class.

SEASON : middle of August.



SECTION OF EARLY MICHIGAN.

## EARLY PURPLE.

For home use, as a dessert peach, this is one of the best of its season. Between 1860 and 1870 this variety was grown as the earliest market peach in Southern Ontario, but its extreme tenderness of flesh and rapid softening after maturity led to its giving place to other varieties.

TREE : thrifty ; vigorous ; hardy ; fairly productive.

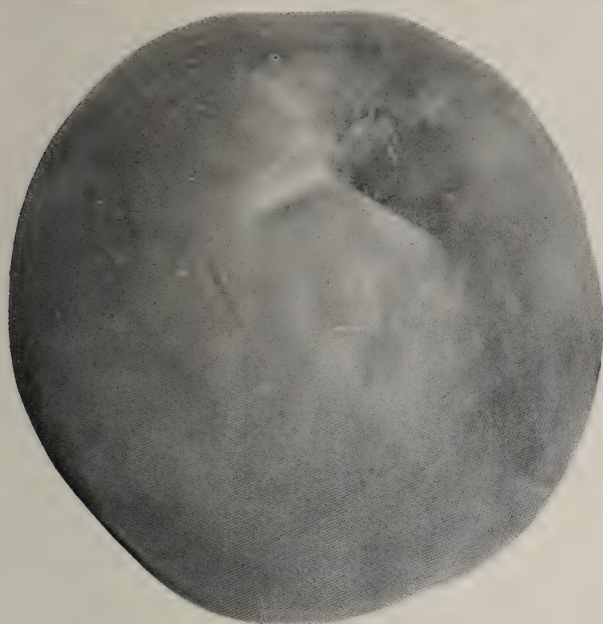
FRUIT : form, irregular, ovate, one-sided ; skin, bright red, downy ; basin deep ; stone almost free.

FLESH : greenish white in color ; texture, very tender, very juicy melting ; flavor, sweet, rich, agreeable.

QUALITY : dessert very good ; cooking poor.

VALUE : near market third class ; distant market poor.

SEASON : late August to early September.



ELBERTA

**FRUIT :** medium to large, roundish oval, one side somewhat larger than the other, suture distinct; skin lemon yellow, with a fine red cheek; stone free, deeply corrugated, pointed.

**FLESH :** yellow; texture, moderately juicy.

**QUALITY :** dessert fair; cooking, best.

**VALUE :** home market first class; foreign market first class.

**SEASON :** late September, about a week later than Early Crawford.



SECTION OF ELBERTA.

#### ENGOL (*Mammeth*).

A valuable variety for either home use or market.

**TREE :** strong upright grower; quite productive.

**FRUIT :** medium to large; form roundish; cavity medium; apex slight; suture a little over half around; color yellow, with reddish cheek.

**FLESH :** color yellow, with tinge of red at pit; texture tender, juicy; flavor pleasant. nearly sweet; free:

**QUALITY :** dessert or cooking very good.

**VALUE :** market first class.

**SEASON :** first half of September.



## FITZGERALD



FITZGERALD.

Since the Early Crawford has been such a popular peach both for home use and market, every new introduction of a variety which is of the same class, has been welcomed by the public, especially where it may be used to extend the season. The Fitzgerald is not so large as the Early Crawford, but to many the flavor is finer for dessert, and its season is a trifle later. Like the latter, it is too tender for very long shipments.

ORIGIN: in the garden of Mr. Fitzgerald, Oakville, Ontario, about 1895.

TREE: hardy, healthy and productive.

FRUIT: size medium to large; form roundish ovate; color bright yellow, covered with deep red; down moderate in quality; cavity broad and deep; apex a small point in a slightly depressed basin; suture distinct; stone free.

FLESH: yellow, with red at pit; texture tender and juicy; flavor excellent.

QUALITY: dessert good.

VALUE: home market first class.

SEASON: early to mid September in Niagara District.

ADAPTATION: one of the hardiest varieties and successfully grown in Georgian Bay District.



SECTION OF FITZGERALD.

## FOSTER.

A large yellow peach of the Early Crawford class, considered a little better in quality, but not so productive.

ORIGIN: J. T. Foster, Medford, Massachusetts.

TREE: vigorous; tender in fruit bud; not very productive.

FRUIT: size large; form roundish, slightly flattened; with a slight suture; color, bright yellow, shaded with orange red.

FLESH: free; color bright yellow, tinged with red at pit; texture tender, juicy; flavor rich, vinous, pleasant, subacid.

QUALITY: dessert good; cooking good.

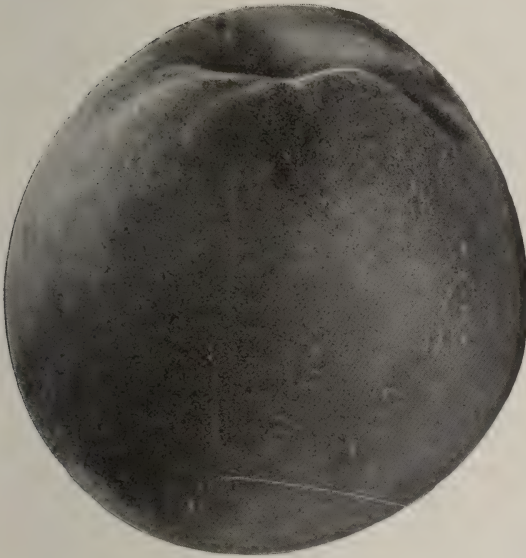
VALUE: near market first class.

SEASON: early to mid September.

## GOLDEN DROP.

"Medium, roundish ovate; color rich yellow, or, as it grows in the South, 'a sort of transparent golden yellow,' often with a blushed cheek; cavity broad, shallow; suture obscure except near apex. Flesh yellow, vinous, almost sweet, good; pit free. Season late September. Attractive in market."—*Budd*.

## GREENSBORO



GREENSBORO.

The best dessert peach of its season, but too tender in flesh to be a good shipper; worthy of a place in the home garden.

ORIGIN: North Carolina.

TREE: vigorous; very productive; an early bearer.

FRUIT: large; form flattened; color a deep cream with bright red cheek; cavity narrow, deep; suture slight; apex sunken; not subject to rot.

FLESH: color cream; texture tender, melting, very juicy; flavor sweet and agreeable; free stone.

QUALITY: dessert good.

VALUE: market second class.

SEASON: mid August.



SECTION OF GREENSBORO.



HALE (*Hale's Early.*)

An early peach of very beautiful appearance, but inclined to rot before it ripens. The flesh remains firm, even after the outside presents the appearance of being ripe, so that it is not a favorite variety. Its comparative earliness at one time made it a very popular market variety, but its season is now preceded by that of Sneed, Greensboro, Early Rivers, Alexander and Triumph.

ORIGIN : Ohio.

TREE : vigorous, healthy and productive.

FRUIT : medium to large, form roundish ; color of skin, dark red on sunny side, green with splash of red on shady side ; apex small, slightly pointed in dimpled depression ; cavity deep ; suture extends to apex ; pit half free.

FLESH : greenish yellow to white ; texture firm until very ripe, then melting and juicy ; flavor sweet and agreeable.

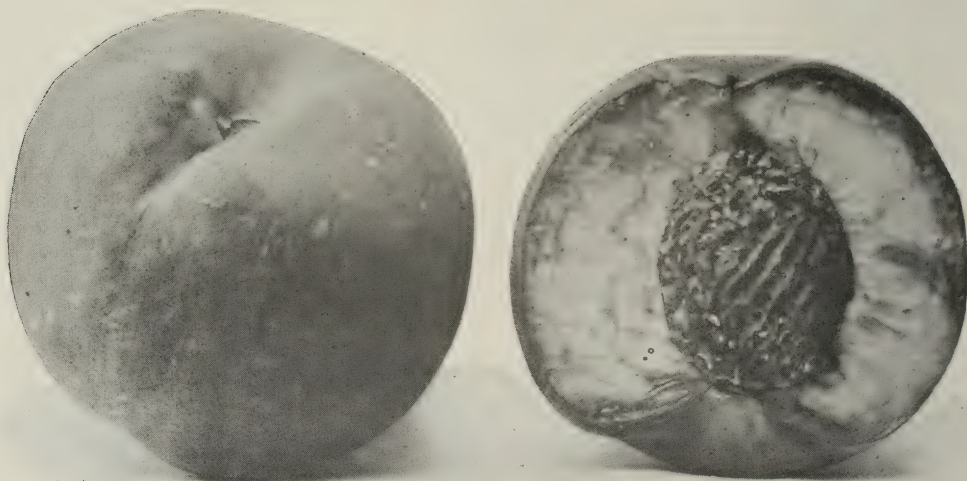
QUALITY : dessert and cooking fair.

VALUE : home market second class.

SEASON : late August.

HYNES (*Hyne's Surprise.*)

A very good early dessert peach, but the fruit is inclined to rot in wet seasons.



HYNES.

ORIGIN : introduced in 1895 by Mr. S. D. Willard of Geneva, N.Y.

TREE : vigorous ; productive.

FRUIT : form roundish, slightly one-sided ; size medium, color greenish white with bright red cheek, sometimes deep red in the sun ; cavity narrow and deep ; suture distinct ; dots numerous ; skin thin and tenacious ; stone, semi-cling.

FLESH : color yellowish white ; texture juicy ; flavor sweet and agreeable.

QUALITY : dessert, good to very good.

VALUE : home market first class ; distant market third class.

SEASON : mid to late August.

## JACQUES RARERIPE.

A fine yellow peach, succeeding the Early Crawford, but too tender in flesh for distant shipment.

ORIGIN : Massachusetts.

TREE : vigorous, healthy and productive.

FRUIT : size large ; form roundish oblate ; color dark yellow, shaded with red, especially on the sunny side ; down heavy ; cavity large and deep ; apex in a depression ; suture distinct ; stone free.



JACQUES RARERIPE.



SECTION OF JACQUES RARERIPE.

8 F. O.

FLESH : color deep yellow, red at the pit ; texture tender, juicy ; flavor good, not very sweet.

QUALITY : dessert good ; cooking very good.

VALUE : near market first class ; distant market, second class.

SEASON : mid September.



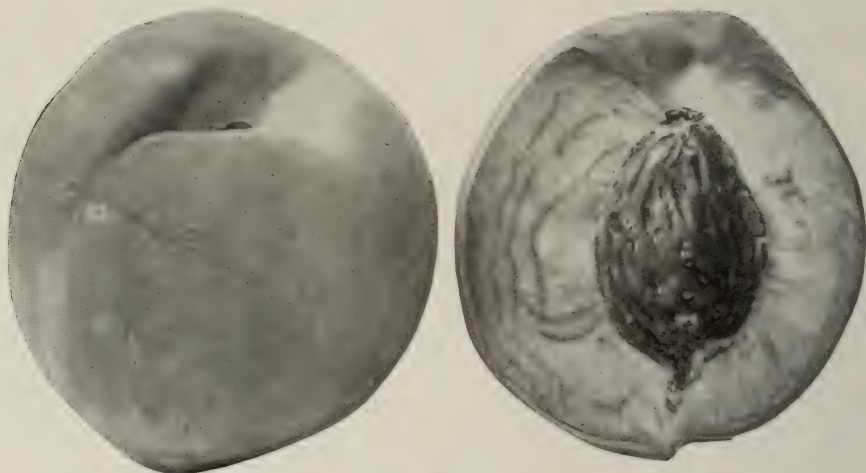
## KALAMAZOO.

A popular market peach in Michigan ; inferior to Elberta.

ORIGIN : Michigan.

TREE : vigorous and very productive.

FRUIT : medium in size, form roundish oval, sides unequal ; color yellow, with red cheek ; cavity deep, narrow, irregular ; apex a small point in a slight depression ; suture traceable beyond the apex ; free stone.



KALAMAZOO.

FLESH : color yellow, red at pit ; texture moderately tender and juicy ; flavor fairly sweet.

QUALITY : dessert poor ; cooking good.

VALUE : near market good ; rather too small to sell with Elberta, or even to follow that large, showy variety.

SEASON : mid to late September.

## LATE CRAWFORD.

A fine large yellow peach, not quite equal to Early Crawford in flavor. It has not been very profitable because the tree is not very productive and the fruit is inclined to drop before it reaches its best condition.

ORIGIN : New Jersey.

TREE : vigorous ; only fairly productive.

FRUIT : large to very large ; color dull yellow or olive green, with dark red cheek ; cavity large and deep ; suture traceable ; free stone.

FLESH : deep yellow, red at the stone ; texture juicy and melting ; flavor rich, vinous.

QUALITY : dessert good ; cooking very good.

VALUE : market, first class.

SEASON : late September.

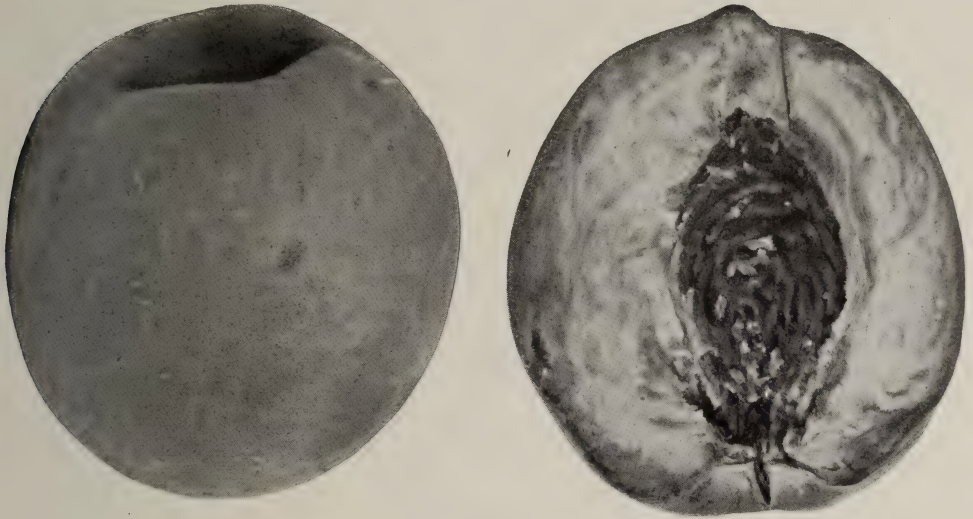
8a F. O.

## LONGHURST.

A very productive late variety, highly esteemed for canning. It is considered a profitable variety by many peach growers, but unless given the best culture, the fruit is small and unattractive in appearance.

**TREE:** hardy; fairly vigorous; very productive. Budd says the fruit buds of this variety have proven exceptionally hardy in Michigan.

**FRUIT:** medium in size; form oval, larger on side of suture, which is clearly traceable, ending in a pointed apex; color dull yellow, with dark red cheek in sun; down thick; cavity deep, abrupt, shouldered; pit small, free.



LONGHURST.

**FLESH:** color yellow, red at pit; texture tender, almost buttery, moderately juicy; flavor vinous, sweet, agreeable.

**QUALITY:** dessert, fair; cooking or preserving very good.

**VALUE:** market second class, unless unusually well grown.

**SEASON:** late September to early October.

## LEMON CLING.

A large and showy peach, at one time planted freely in Ontario orchards, but of late discarded because of its cling stone.

**ORIGIN:** South Carolina.

**TREE:** vigorous, hardy and productive.

**FRUIT:** large, form roundish, narrowed towards apex, which is large and prominent, somewhat like that of the lemon; skin deep yellow, with a dark brownish-red cheek.

**FLESH:** color yellow, tinged with red at the pit; texture firm, not very juicy; flavor pleasant, sprightly, subacid.

**QUALITY:** dessert fair; cooking, fair.

**VALUE:** market second class.

**SEASON:** late September.



## LEWIS.

A fine market peach to succeed St. John and to precede Early Crawford.

ORIGIN: Michigan.

TREE: healthy, vigorous, very productive.

FRUIT: medium to large; form round; color yellowish white, largely overspread with red; suture depressed.

FLESH: yellowish white, red next the pit; texture tender, juicy; flavor very pleasant.

QUALITY: dessert good; cooking good.

VALUE: home market first class; distant market second class.

SEASON: mid September.

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## McCONNELL

A very attractive looking, late, white flesh peach.

ORIGIN: a seedling raised by Mr. McConnell, Essex County.

TREE: a good thrifty grower; productive.

FRUIT: above medium; color white with beautiful crimson blush; form round.

FLESH: cling; color pure white; texture firm, juicy; flavor pleasant.

QUALITY: dessert poor; cooking poor; good pickler.

VALUE: not tested.

SEASON: mid October.

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MATTHEW (*Matthew's Beauty*.)

A fine attractive appearing yellow peach, with beautiful cheek, resembling Elberta in exterior, but nearly a week later, and of much better quality. From its appearance it might be called "late Elberta."

FRUIT: form roundish ovate, slightly flattened; size about 2½ inches; color yellow with dark red cheek; suture half round; apex depressed; cavity narrow, deep.

FLESH: free; color yellow; texture moderately firm; flavor sweet, good.

QUALITY: dessert or cooking, very good.

VALUE: market first class.

SEASON: late September to early October.

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## MOUNTAIN ROSE.

Desirable in the home garden as a dessert peach.

ORIGIN: New Jersey.

TREE: vigorous; productive.

FRUIT: size medium to large; form roundish; suture traceable; apex a point; color of skin white, with bright red cheek.

FLESH: creamy white, with red tint at the pit; texture tender, melting, very juicy; flavor sweet, delicious; free.

QUALITY: first class for dessert.

VALUE: market second class.

SEASON: early to mid September.

## NEW PROLIFIC.

A peach of the Crawford type, a few days later, which is highly esteemed by many peach growers. Like the Crawford it is too tender in flesh for distant shipment, unless picked from the tree before it reaches full maturity.

TREE : healthy ; vigorous ; productive.

FRUIT : size medium to large, form round ; color yellow, with bright red cheek ; cavity narrow and deep ; suture, distinct, extending beyond the apex.



NEW PROLIFIC.

FLESH : yellow ; slightly tinted with red at the pit ; texture tender, flavor sweet, delicate, very pleasant ; free from pit.

QUALITY : dessert first class ; cooking first class.

VALUE : home markets first class.

SEASON : mid to late September.

## OLDMIXON FREE.

An old standard variety considerably planted in the older commercial peach orchards of the Niagara Peninsula to succeed the Early Crawford ; a white flesh peach with a red cheek presenting a good appearance in the basket ; its fault as a market variety is its dropping almost before it attained full color and its tender flesh ; valuable for dessert purposes.

ORIGIN : a seedling of Oldmixon Cling which was brought to America by Sir John Oldmixon.

TREE : vigorous ; spreading ; moderately productive.

FRUIT : medium to large ; form roundish oval, one-sided, suture distinct toward the apex which is not marked ; cavity narrow, color creamy white, marbled with red and with a deep red cheek ; bloom thin.

FLESH : free from pit ; color creamy white, red at pit ; texture tender ; flavor sweet, rich, vinous.

QUALITY : dessert very good ; cooking or canning whole, very good.

VALUE : market hardly first class compared with larger yellow varieties of the same season.

SEASON : early September.



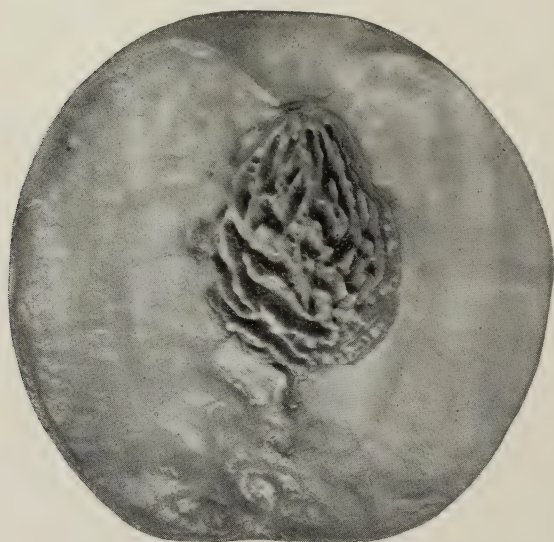
RIVERS (*Early Rivers*).

When first introduced, this peach was widely planted for market because of its fine size and early season, coming in between Alexander and Hale. Its great fault is its delicate



RIVERS.

skin and tender flesh which show the slightest bruise, so that the most careful handling is necessary. The fruit needs thinning for size and color, and then it can be sent only to the nearest markets.



SECTION OF RIVERS.

ORIGIN : by Thos. Rivers, of Sawbridgeworth, England.

TREE : very vigorous; fairly hardy; very productive.

FRUIT : medium to large, roundish, often somewhat oblong and flattened on the sides, and more or less one-sided; skin smooth, light green, almost white, delicately shaded with red; cavity small and deep; apex small in a narrow, deep depression; suture deep and distinct; stone half cling, inclined to split.

FLESH : color creamy white; texture melting, juicy.

QUALITY : fair for dessert; fair for cooking.

VALUE : second class for near market.

SEASON : mid August

## REEVES FAVORITE.

A profitable peach because of its large size and excellent color, but lacking in productiveness.

ORIGIN: in New Jersey, by Samuel Reeves.

TREE: thrifty; upright; moderately productive.

FRUIT: large, form roundish; color yellow with red cheek; cavity deep and broad; suture traceable; apex pointed, distinct.



REEVES FAVORITE.

FLESH: color yellow. with red tint at the pit; texture tender, juicy; flavor sweet, vinous, very pleasant; free.

QUALITY: dessert good; canning or cooking good.

VALUE: market first class.

SEASON: mid September; a few days later than Early Crawford.

## REID.

A round yellow flesh peach, closely succeeding Elberta.

TREE: healthy, vigorous, productive.

FRUIT: medium to large in size; form roundish ovate, color yellow nearly covered with red; suture distinct; apex depressed, prominent.

FLESH: free; color yellow marked with red at pit; texture tender, juicy; flavor moderately sweet.

QUALITY: cooking good; dessert fair.

VALUE: market second class.

SEASON: late September.

## SALWAY.

A popular late market variety, which usually ripens in the peach sections of Ontario before frost. Hilborn says that in Essex it reaches maturity four years out of five.

ORIGIN: England.

TREE: vigorous; productive; fairly hardy.

FRUIT: large; roundish, somewhat one-sided; skin yellow with red cheeks on sunny side; suture broad.

FLESH: free; color yellow, red at the pit; texture tender, juicy; flavor sweet, good.

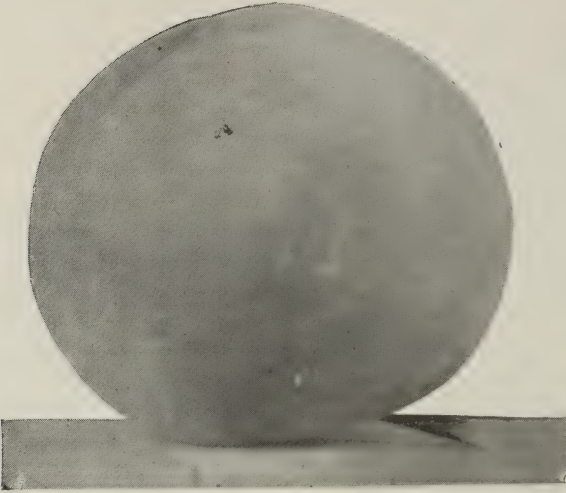
QUALITY: good.

VALUE: market first class if well ripened.

SEASON: mid October.



## ST. JOHN.

*(Yellow St. John.)*

ST. JOHN.

The earliest really good peach for either home use or market. Its season is the end of August, just before the Early Crawford; and its fair size, its yellow flesh, attractive skin and good quality, make it one of the most satisfactory peaches for all purposes.

ORIGIN : North America.

TREE : vigorous and productive.

FRUIT : form round; size large; skin yellow, with dark red cheek; suture traceable on one side, sometimes by a red line; apex a tiny point in a rather deep depression; free-stone.

FLESH : color yellow, tinted red at the stone; texture tender and juicy; flavor sweet rich and agreeable.

QUALITY : dessert and cooking very good.

VALUE : market first-class, the best of its season.

SEASON : Late August.



SECTION OF ST. JOHN.

## SMOCK.

A first class late market peach.

ORIGIN : New Jersey.

TREE : moderately vigorous; wood brittle; leaves not subject to curl; productive.

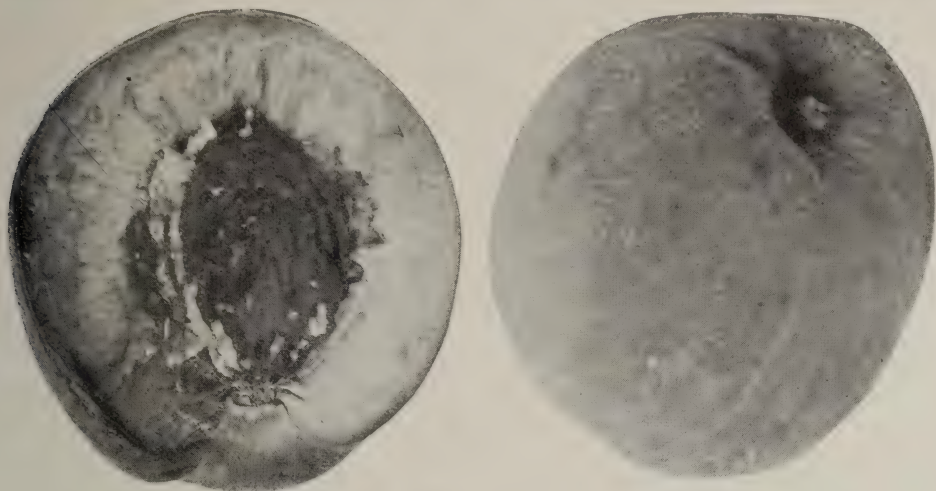
FRUIT : large; oval; color yellow with orange red cheek; bloom heavy; cavity narrow and deep; suture obscure; apex slightly extended.

FLESH : free; color yellow, with red at pit; texture dry, tender; flavor agreeable, not sweet, distinctive.

QUALITY : cooking or drying good.

VALUE : market first class for its season.

SEASON : early October.



SMOCK.

## SNEED.

A promising early variety for home use and near markets.

ORIGIN : Tennessee, by Judge Sneed of Memphis, about 1880, from a pit of the Chinese Cling.

TREE : vigorous, but slender in young growth ; productive ; an early bearer.

FRUIT : medium ; form roundish oval, slightly one-sided ; skin light greenish white, with red cheek, and a short thick down ; cavity narrow and deep, with distinct suture, and a small pointed apex, in a slight depression.



SNEED.

FLESH : semi-cling ; color yellowish white at maturity ; texture tender, fine, very juicy ; flavor mild, vinous, pleasant.

QUALITY : dessert good.

VALUE : home market second class ; distant market useless.

SEASON : Late July to early August.



STEVENS. (*Stephens Rareripe*).

A popular late white flesh peach, and a good shipper.

ORIGIN: New Jersey.

TREE: vigorous and productive.

FRUIT: size above medium; form roundish ovate; color whitish ground with dark red cheek; cavity narrow and deep; suture traceable.



STEVENS.

FLESH: whitish with red at pit; free; texture tender, juicy; flavor sprightly and agreeable.

QUALITY: dessert good; cooking good.

VALUE: market first class.

SEASON: mid October.

## THURBER.

A magnificent white flesh peach to fill in between Early Crawford and Elberta.

ORIGIN: seedling of Lee, raised by Dr. L. E. Berckmans of Augusta, Georgia.

TREE: very vigorous; productive.

FRUIT: size large; form roundish, enlarged at centre along suture; color creamy white, bright red cheek; cavity large, deep; suture marked; apex small, pointed; bloom white; skin thin.

FLESH: white, red at pit, free; texture tender, juicy; flavor sweet, vinous, excellent.

QUALITY: dessert very good to best; cooking or canning very good.

VALUE: home market first class.

SEASON: mid September.

## TRIUMPH.

A valuable commercial variety, to follow the Alexander, but not very popular on account of its heavy coat of down, its dull color, and its susceptibility to rot.

ORIGIN: Georgia, seed of Alexander.

TREE: vigorous, hardy, very productive, subject to twig blight and leaf curl.

FRUIT: medium size; form roundish, somewhat shouldered and flattened; color yellow ground nearly covered with red and markings of very dark red; cavity deep; apex small, in a decided depression; suture distinct; pit semi-cling.

FLESH: yellow; texture fine, juicy; flavor sweet, rich and excellent.

QUALITY: good.

VALUE: home market second class except under special conditions.

SEASON: mid August

## TYHURST.

A very attractive golden-yellow peach ; considered a profitable variety for the commercial orchard. After fruiting it several years at our Maplehurst station, we think its value has been somewhat over-estimated.

ORIGIN : a seedling raised by Mr. Tyhurst, of Leamington, Essex County. This gentleman was so pleased with the peach that he planted nearly his whole farm with trees grown from its pits, and made considerable money out of his venture.

TREE : moderately vigorous ; quite productive ; fruit is inclined to drop as soon as ripe.

FRUIT : size medium ; form ovate ; suture distinct on one side, terminating in a small black sharp point ; color deep yellow, with tinge of red in the sun ; skin separates easily from the flesh.

FLESH : free ; color pale yellow ; texture very tender, fine grained, melting, juicy ; flavor excellent.

QUALITY : dessert very good to best ; cooking very good.

VALUE : home market first class ; distant market second class because too tender.

SEASON : mid September.

## WHEATLAND.

A large and beautiful yellow flesh peach to follow Early Crawford ; a valuable variety for home use or market ; not a long keeper.

ORIGIN : New York State.

TREE : vigorous.

FRUIT : size large ; form roundish, slightly enlarged along the line of suture ; color yellow, well overspread with red, usually prettily dappled with red about the small pointed apex ; cavity broad and deep.



WHEATLAND.

FLESH : free ; color pale yellow tinted with red at the pit ; texture melting, tender, juicy ; flavor rich, sweet, delicious.

QUALITY : very good for dessert or cooking.

VALUE : market first class

SEASON : mid to late September.



## WILLETT.

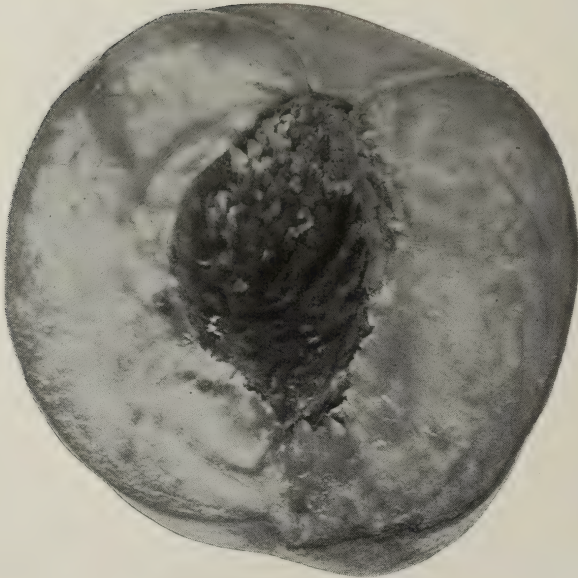
An attractive and profitable late market peach, to come in between Elberta and Smock; later than Matthews' Beauty.

TREE: vigorous; spreading; productive.

FRUIT: medium to large in size; form nearly round, and enlarged along one side of the suture; cavity abrupt, medium; apex distinct; color yellow with mottling of deep red in the sun.



WILLETT.



SECTION OF WILLETT.

FLESH: free; greenish yellow, with red tint at the pit; texture rather firm, moderately juicy; flavor moderately sweet, good.

QUALITY: dessert good; cooking very good.

VALUE: market first class.

SEASON: early October.

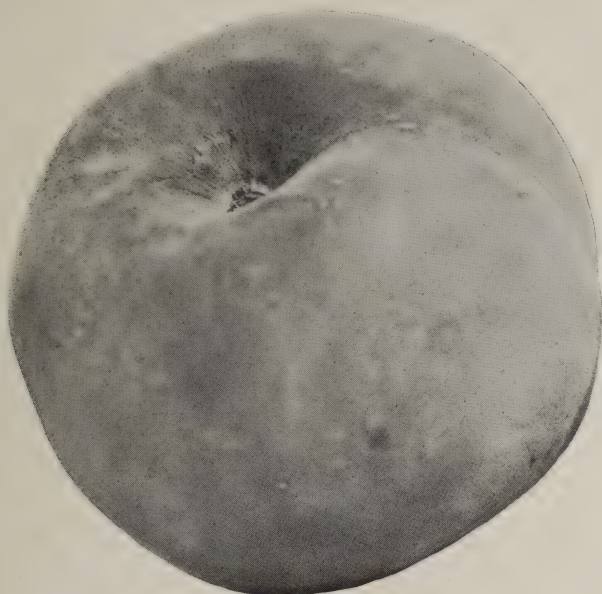
## WONDERFUL.

A new variety of great size and beauty.

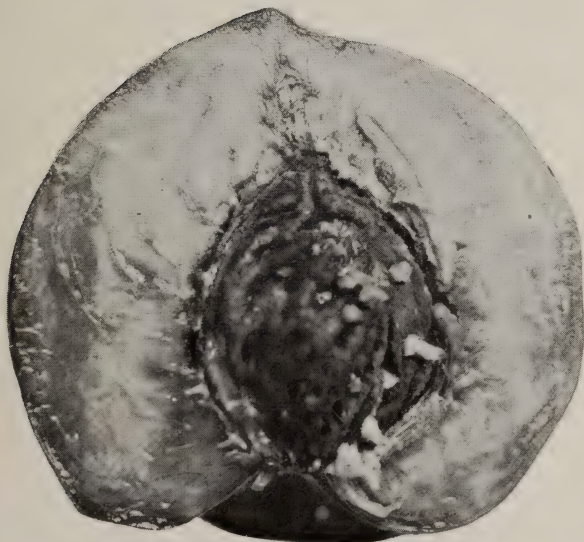
ORIGIN: United States.

TREE: a vigorous grower; but lacking in productiveness.

FRUIT: large; form roundish; cavity narrow and deep; suture traceable; apex a small point, sometimes depressed; color yellow with bright red on sunny side.



WONDERFUL.



SECTION OF WONDERFUL.

FLESH: light creamy yellow, red at pit; texture tender, melting, juicy; flavor sweet, vinous, pleasant; free.

QUALITY: dessert good; cooking good.

VALUE: market first class.

SEASON: mid September.



## THE PEAR.

The pear succeeds all over the best apple districts of Ontario, but few good hardy varieties have yet been found, hence the commercial culture of the pear does not extend as far north as the apple. The principal pear orchards are found in southern Ontario. There are many good orchards, however, along Lake Ontario as far east as the Bay of Quinte and north to the Georgian Bay.

In eastern Ontario, only a few kinds succeed, and these are not planted on a commercial scale. These hardy varieties are grown to a limited extent for home use as far north as latitude 45 degrees and some of the Russian pears, though inferior in quality and very subject to blight, may be grown still further north.

The pear stands distant shipment well if picked at the right time, and properly packed and handled in transit, and hence larger quantities are being sent to distant markets every year, and as a rule good prices are obtained for the fruit.

The general directions for the preparation of the land, soil and planting as given for the apple apply to the pear, with but slight alterations. While pears succeed in the same kind of soils as the apple, clay loams, if well drained, suit them best. Pear trees two years old are better than those three years old, as they are easier to transplant, since pear trees have not so good a root system as the apple. Standard trees should be set at least twenty feet apart each way. Pear trees are shaped and pruned much like the apple, although trees with a central leader are easier obtained and are preferred. They may be headed nearer the ground than the apple, as they are of more upright habit. Many pears are now being grown on dwarf or quince stock. These have the advantage of being earlier than standard trees, and may be planted closer together, fourteen feet apart being a good distance. They do not live as long as standard trees. The dwarf trees are almost always grown without a central leader in Ontario, and branching near the ground. They require more careful pruning than standards. The fruit of some varieties is improved by growing on dwarf stocks, among those succeeding particularly well on this stock being Duchess, Louise, Diel, and Easter Beurre.

Pear trees are very much subject to blight which as yet cannot be controlled by any practical means. It has been observed, however, that trees usually blight most when making strong succulent growth, hence it is best to not encourage a strong growth. Some varieties are more subject to blight than others, and when planting this should be taken into consideration. In planting a pear orchard, it is also desirable to mix the varieties, avoiding large blocks of any one kind, as better crops will thus be obtained, some varieties being almost sterile when planted by themselves.

The picking of pears requires good judgment. If they are picked too early the fruit will not get its best flavor, but if picked too ripe, it will spoil before reaching the market. Pears, unlike most fruits, ripen well and develop a good flavor when picked while still green and hard, but to obtain this flavor the fruit should have reached its full size.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

*Commercial:* Giffard, Clapp, Bartlett, Boussock, Flemish (hardy, subject to spot), Howell, Louise, Duchess, Bosc, Clairgeau, Anjou, Kieffer.

*Domestic:* Summer Doyenne, Giffard, Bartlett, Flemish (for the north), Sheldon, Seckel, Bosc, Anjou, Lawrence, Josephine, Winter Nelis.

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DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Niagara District:* By Linus Woolverton, Grimsby, Ont.

*Commercial:* Chambers, Wilder, Giffard, Clapp, Bartlett, Hardy, Bosc, Howell, Louise, Duchess, Pitmaston, Clairgeau, Anjou, Easter Beurre.

*Domestic:* Doyenne, Manning, Giffard, Boussock, Rostiezer, Marguerite, Sheldon, Seckel, Triumph, Ritson, Louise, Hardy, Diel, Anjou, Lawrence.

*Burlington District:* By A. W. Peart, Burlington, Ont.

*Commercial:* Wilder, Clapp, Bartlett, Boussock, Louise, Duchess (dwarf), Anjou, Kieffer, Winter Nelis, Easter Beurre.

*Domestic:* Wilder, Bartlett, Louise, Anjou, Winter Nelis.

*Bay of Quinte District:* By W. H. Dempsey, Trenton, Ont.

*Commercial and Domestic:* Giffard, Tyson, Clapp, Boussock, Hardy, White Doyenne, Dempsey, Bosc, Clairgeau, Goodale, Lawrence, Josephine.

*St. Lawrence District:* By Harold Jones, Maitland, Ont.

*Domestic:* Clapp, Flemish, Ritson.

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DESCRIPTION OF VARIETIES.

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ANSAULT.

Claimed to be a good general purpose pear for home uses, but not as yet widely tested.

ORIGIN : France.

TREE : an early and abundant bearer.

FRUIT : size medium ; roundish oblate pyriform ; skin green, yellowing at maturity, mostly covered with russet ; stem  $\frac{1}{2}$  inch to one inch long, in a small irregular, often oblique cavity ; calyx small, open in an abrupt, deep basin.

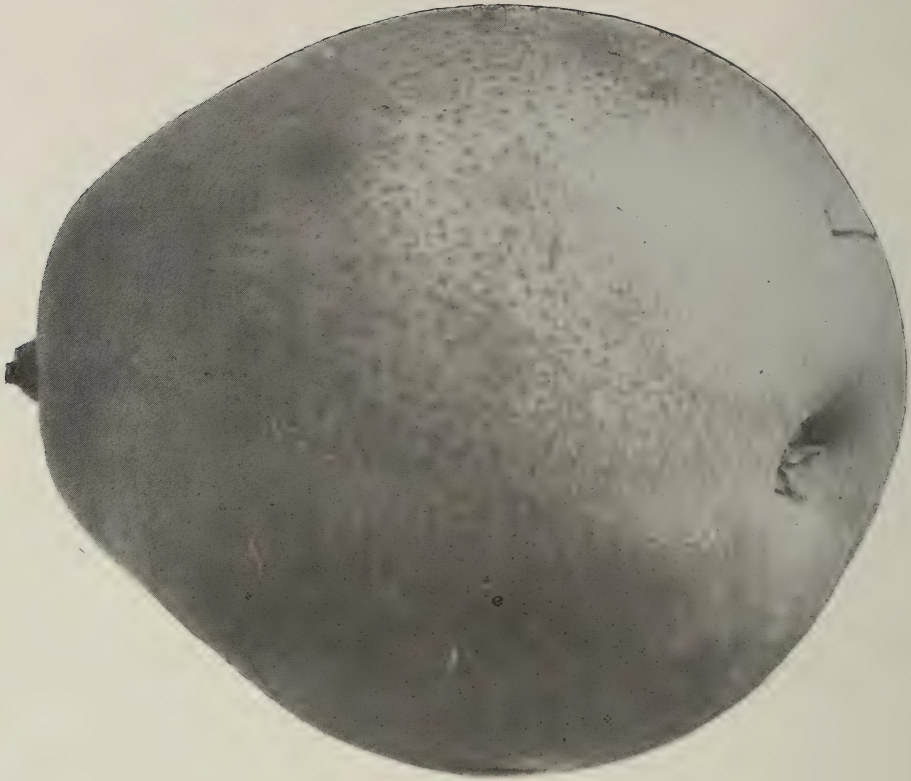
FLESH : color creamy white ; texture tender, fine grained, buttery, juicy ; flavor agreeable, aromatic, very pleasant.

QUALITY : fair for all purposes.

VALUE : home market second class.

SEASON : September.





ANJOU.



SECTION OF ANJOU.

## ANJOU.

(*Beurre d'Anjou, Ne Plus Meuris of Le Roy.*)

A fine market pear, succeeding admirably on quince roots, but on pear roots the tree is not so productive, nor the fruit so large. Its fine size, and melting, buttery texture, make it a favorite market pear for the month of December, and past experience proves it a desirable variety to export to Great Britain.

ORIGIN : Louvain, Belgium, about 1823 ; named Ne Plus Meuris, after Father Meuris.

TREE : a vigorous, strong grower ; productiveness scarcely first rate even on the quince, third rate on the pear.

FRUIT : large ; form obovate, blunt pyriform, sides often uneven, and samples not very uniform ; skin thick, yellow at maturity, with greenish patches and brown dots, brownish red on sunny side ; stem scarcely half an inch long, stout and fleshy ; calyx open, set in a shallow basin ; core small, seeds few if any.

FLESH : white ; texture fine grained, buttery, melting ; flavor pleasant, perfumed, not very sweet.

QUALITY : table or cooking good.

VALUE : home market first class ; foreign market first class.

SEASON : November.

ADAPTATION : succeeds best south of Toronto.

## BAUDRY.

A promising new winter pear, which has been fruiting at our Maplehurst station as a dwarf.

FRUIT : size large ; form oblong, pyriform ; color yellowish green, with russet patches.

FLESH : color yellow ; texture tender, but gritty at the core ; flavor very good.

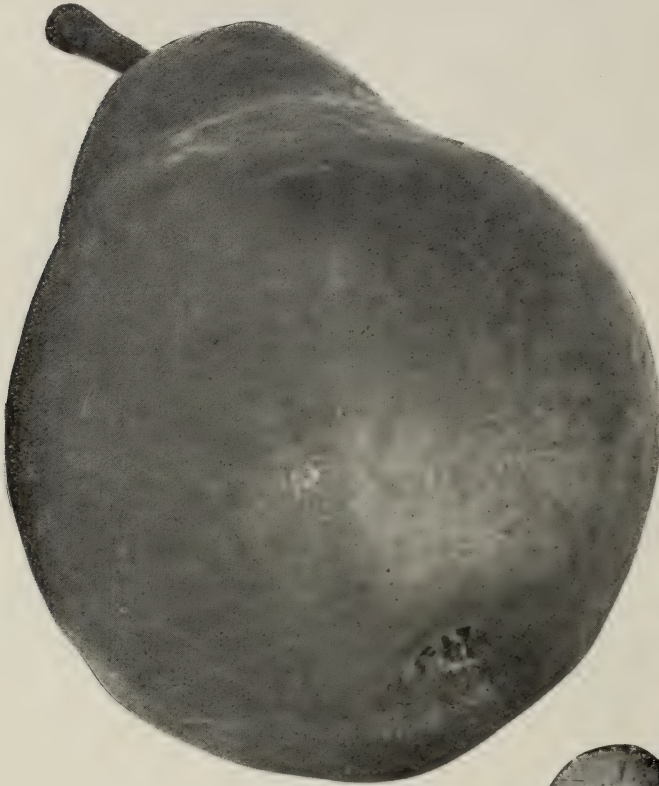
QUALITY : very good for dessert and cooking.

VALUE : apparently first class for market.

SEASON : late winter.

9 F.O.





BARTLETT.

ORIGIN: Berkshire, England, 1770, propagated by Mr. Williams, near London. Introduced into America and disseminated by Enoch Bartlett of Boston.

TREE: healthy, vigorous, half-hardy, overcomes blight better than most varieties, very productive.

FRUIT: large, oblong, obtuse, pyriform; color yellow, with very numerous minute brown dots, often russeted at the apex; stem  $1\frac{1}{4}$  inches long, in a small irregular cavity; calyx, open in an irregular basin.

FLESH: creamy white, fine grained, very buttery and juicy; flavor sweet, perfumed, vinous.

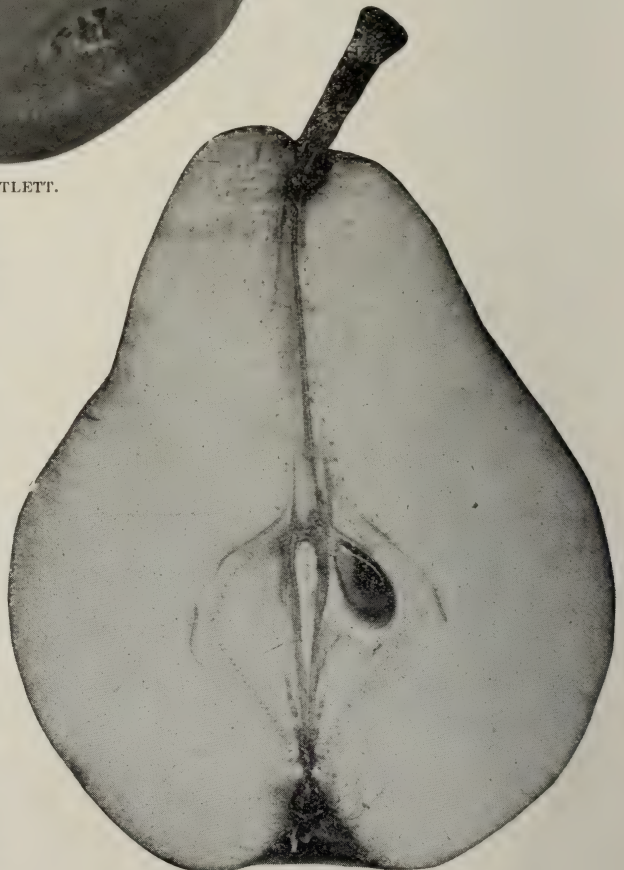
QUALITY: dessert, very good; market, best.

SEASON: early to mid September.

Adaptation: succeeds admirably in southern Ontario, and as far north as our Bay of Quinte station.

BARTLETT (*Williams' Boncretien*).

No pear of the same season equals in popularity the Bartlett, for either dessert or canning. Indeed, while it is in the market, no other pear compares with it in price or brings as much profit to the grower. Of late large orchards of this one variety have been planted in Canada, and there is a growing demand for it in the Northwest Provinces. With trustworthy cold storage it may be exported to Great Britain with profit.



SECTION OF BARTLETT.

## BOSC.

(Beurre Bosc, *Downing*.)

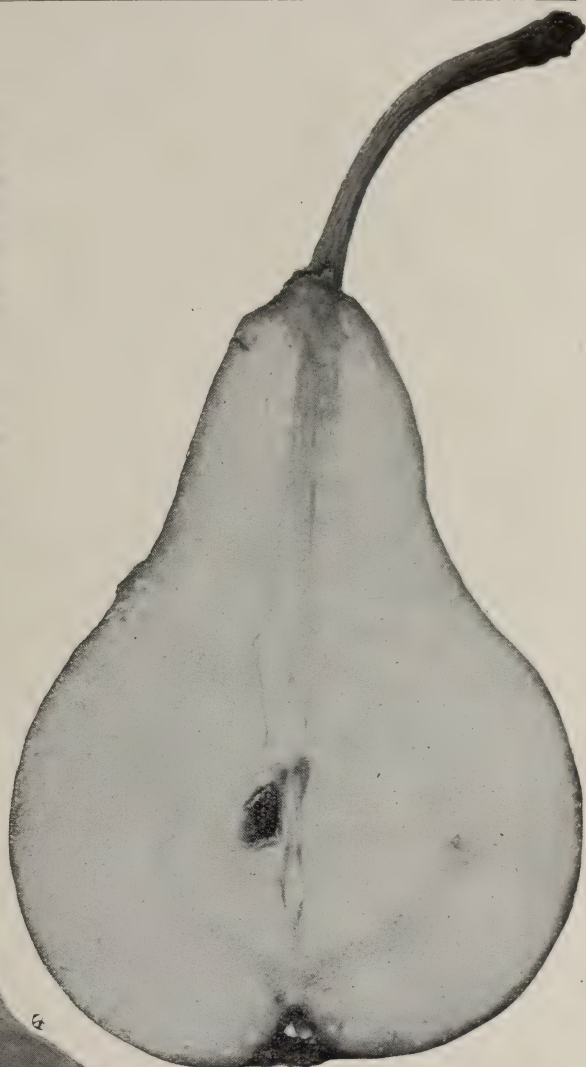
The Bosc pear is not as widely known among cultivators in Canada as its merits deserve. Though a russet, it yellows as it ripens; the pear is large in size, and uniform on the tree as if thinned purposely; and the texture is such that it can be exported in fine condition. In quality, a well grown Bosc is first-class. On the whole, we would place this pear among the valuable kinds for planting for export to the foreign markets.

ORIGIN: a chance seedling found in France, and dedicated to M. Bosc, the eminent director of the Jardin des Plantes at Paris, about the year 1835.

TREE: a vigorous grower, and a regular bearer, carrying its fruit singly



Bosc.



SECTION OF BOSC.

and not in clusters as is the habit of some varieties.

FRUIT: large, elongated acute pyriform, covered with slight indentations; color greenish, yellow ground nearly covered with cinnamon russet; stalk  $1\frac{1}{2}$  to 2 inches long, stout and usually curved, inserted without a cavity; calyx open in a shallow basin.

FLESH: white; texture, fine, breaking, juicy; flavor, sweet, rich, delicious.

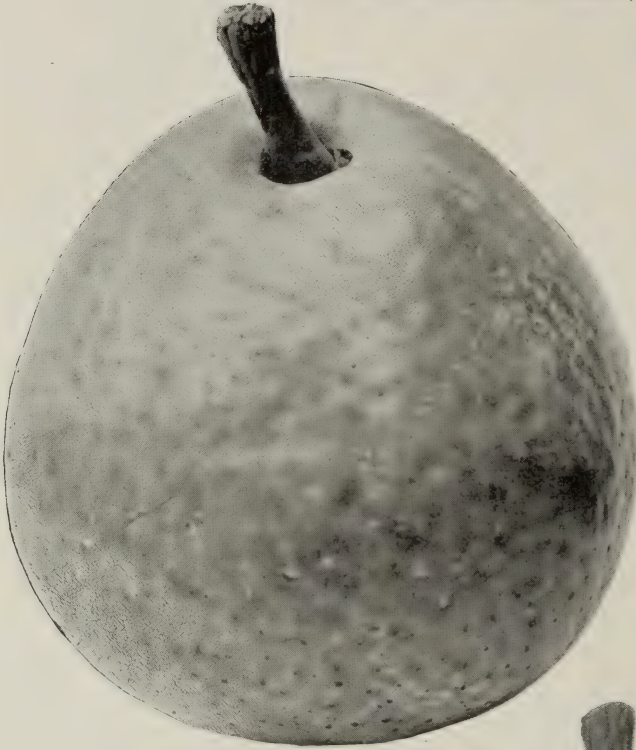
QUALITY: first-class for dessert.

VALUE: first-class for either home or foreign markets.

SEASON: October.

ADAPTATION: southern Ontario, and as far north as Bay of Quinte.



BOUSSOCK (*Doyenne Boussock*).

Boussock.

FRUIT : large ; form roundish, obovate ; skin yellow, with dull red cheek, and numerous rough dots ; stalk fleshy, stout, 1 to 1½ inches in length, in a round cavity ; calyx open, in a shallow russeted depression.

FLESH : white ; texture tender, juicy, if gathered at the right season ; flavor sweet and agreeable.

QUALITY : dessert very good.

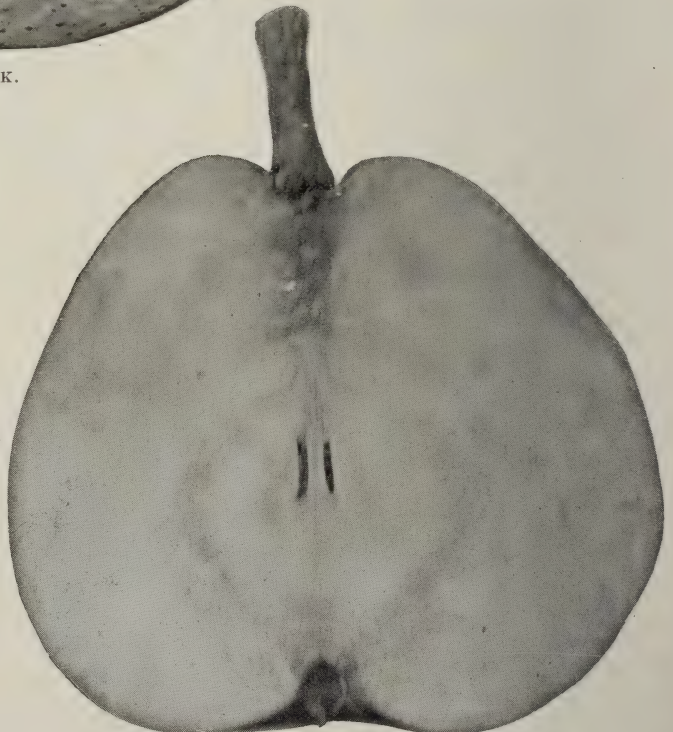
VALUE : near markets first class.

SEASON : September.

Described by Downing as a profitable market sort, but our experience in Canada would lead us to give it a second place when compared with the Bartlett or the Anjou. The tree is a good grower and productive, and the fruit is uniformly large, but it is second class in quality unless eaten just at the proper stage of ripeness, and the tree is inclined to drop its fruit too soon.

ORIGIN : Belgium.

TREE : succeeds best as a standard ; vigorous, hardy and very productive.



SECTION BOUSSOCK.

## BRANDYWINE.

A good general dessert pear, but not much grown for market in Ontario, being so nearly of the same season as Bartlett.

ORIGIN : chance seedling found on the banks of the Brandywine river, Delaware County, Pennsylvania. The original tree fruited for the first time in 1820.

TREE : vigorous ; upright ; fairly productive ; succeeds best on the quince.

FRUIT : size medium ; form conic pyriform ; color of skin greenish-yellow, with blush on the sunny side and dotted and sprinkled with russet ; stem  $\frac{3}{4}$  to  $1\frac{1}{2}$  inches long, fleshy at insertion, which is surrounded by folds ; calyx open in a smooth, shallow basin.

FLESH : color white ; texture tender, melting, very juicy ; flavor sweet, vinous, aromatic.

QUALITY : dessert very good.

VALUE : market second class.

SEASON : early September.

## BUFFUM.

Formerly this pear was much in favor as a profitable orchard variety, because of its productiveness and the wonderful hardiness and vitality of the tree, but of late years it is much less in favor with pear growers on account of its small size and ordinary quality. Some trees of this variety at Maplehurst, forty years planted, have never shown the slightest tendency to blight, and have attained a great height, more resembling Lombardy poplars than pear trees.

ORIGIN : Rhode Island.

TREE : remarkable for its vigorous, symmetrical, erect habit of growth ; it is regularly and fairly productive, but, unless gathered early, the fruit drops badly ; not subject to blight.

FRUIT : medium size, obovate, slight oblong ; skin rough, yellow at maturity, with bright or dull red or russet on sunny side ; dots small, brown ; stalk  $\frac{3}{4}$  inch long in a small cavity ; segments of calyx small, in a small plaited basin.

FLESH : color, yellowish white ; texture, crisp, not fine, not juicy ; flavor, sweet and pleasant.

QUALITY : dessert fair ; cooking fair.

VALUE : home and distant markets second class.

SEASON : September.

ADAPTATION : stated to be hardy in Bruce and Huron counties ; slightly tender in North Ontario county.

## CHAMBERS.

The Chambers pear has been grown at Maplehurst for about ten years on dwarf stock and commends itself as a fine market variety the beginning of August, for it is of a good quality, fairly large, and the tree is productive.

ORIGIN : brought from Maryland to Kentucky by Judge Wm. Chambers.

TREE : moderately vigorous, very hardy, productive.

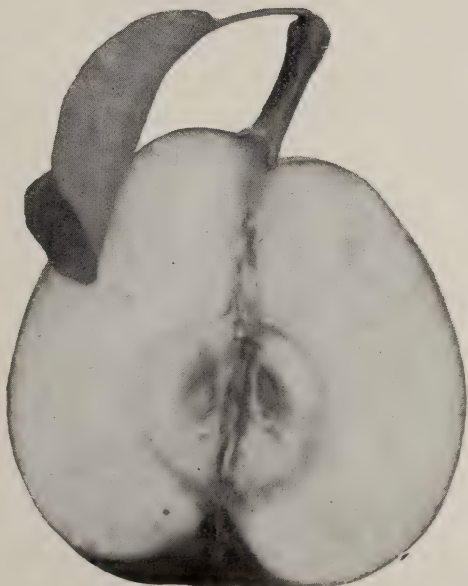
FRUIT : of medium size ; form obtuse, obovate, pyriform ; color pea green, turning yellow when fully mature, with numerous brown and green dots, and reddish brown cheek on sunny side ; stalk stout, 1 inch long, set on an angle in a flat cavity, often one shoulder prominent ; calyx small, half-open ; seeds few.

FLESH : white ; texture tender, fairly juicy ; flavor aromatic, sweet and pleasant.

QUALITY : good.

VALUE : for near market first class.

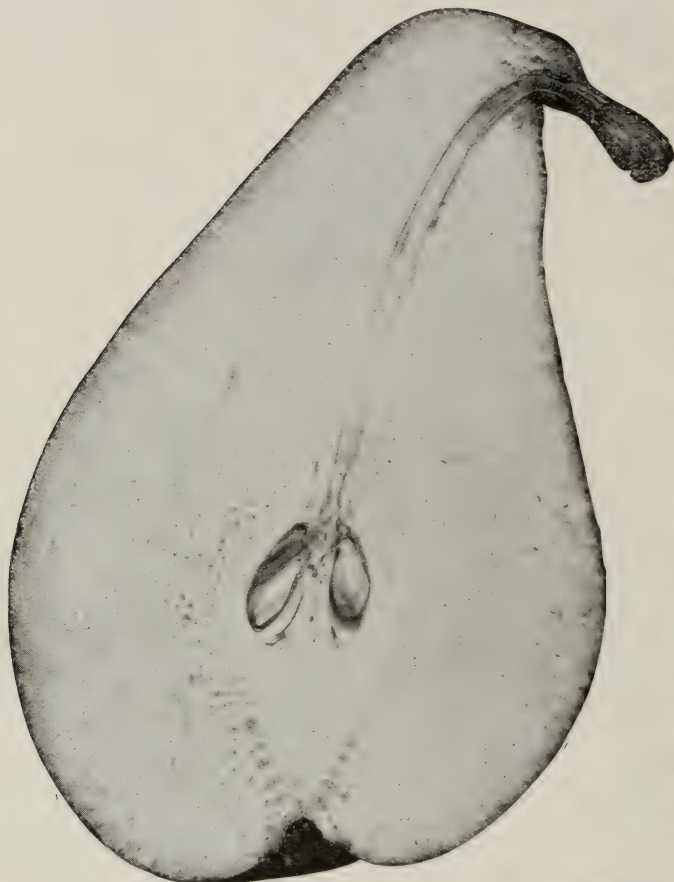
SEASON : early August.



CHAMBERS.



## CLAIRGEAU.



As a commercial pear, especially for a distant market, we know of no variety of the same season that is superior to this variety. Its large size, and the beautiful cheek which it takes on during the month of October, its excellent shipping and keeping qualities, all these combine to make it a profitable variety, and one that is easily grown, either as dwarf or standard. The quality is variable according to the conditions of growth; in France it is counted very good; in England, poor; with us, when well ripened, it is only good.

ORIGIN : Nantes, in France with a gardener named Clairgeau, about 1838.

TREE : first-class in vigor, hardiness and productiveness; wood, stout, and upright in habit of growth; branches, numerous, grown as a dwarf can be trained to make a fine pyramid, but succeeds best as a standard; an early bearer.

FRUIT : large, one-sided, pyriform; skin, green, turning pale yellow at maturity, almost overspread with

splashings and dots of russet, which completely cover it about the stock and the calyx; orange red on sunny side; stalk,  $\frac{3}{4}$  inch long, stout, fleshy at the base, usually set at an angle with the axis; calyx, small, open, in a shallow furrowed basin.

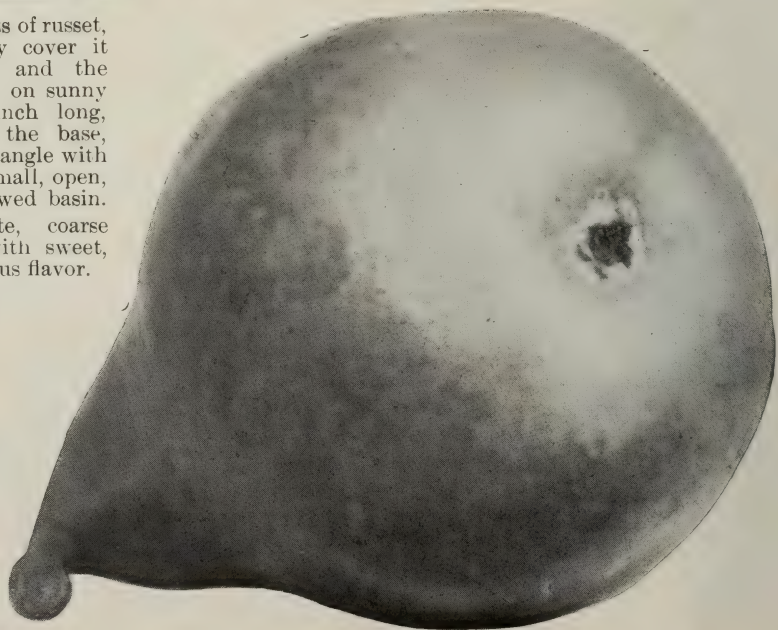
FLESH : white, coarse grained, juicy, with sweet, aromatic and vinous flavor.

VALUE : home or foreign market, first class.

QUALITY : cooking good; dessert good

SEASON : October to November.

ADAPTATION : succeeds admirably as far north as Thornbury; and east as far as Prescott.

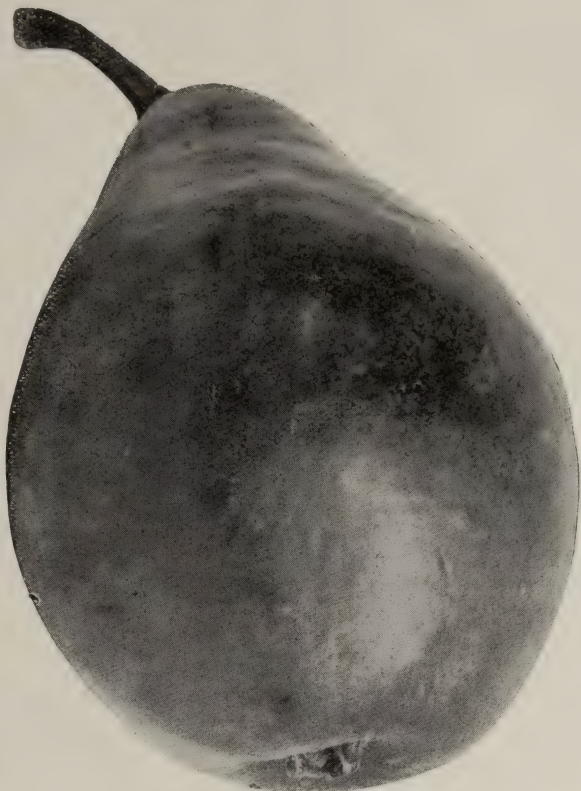


CLAPP (*Clapp's Favorite*).

The Clapp is a beautiful pear where well grown and well colored. It is also of good quality, so that it is well fitted to be a profitable market pear; with one fault, that it soon passes out of prime condition, and, if allowed to ripen on the trees, it will rot at the core. On this account the fruit must be gathered as soon as full grown and well colored, and shipped while firm.

ORIGIN: raised by Thaddeus Clapp, of Dorchester, Mass., U.S.

TREE: upright, vigorous grower, somewhat spreading, forming a symmetrical top; bears fruit of uniformly large size, pretty evenly



CLAPP.

distributed; productive; succeeds well as a dwarf on rich soil; somewhat subject to blight.

FRUIT: very large, pyriform, obovate, usually symmetrical, sometimes with unequal sides; skin pale green, changing to yellowish green, with dull red on sunny side, which becomes bright crimson at maturity, somewhat resembling the coloring of the well-known Louise; stalk stout and fleshy obliquely inserted without cavity; calyx large, half open, in shallow basin.

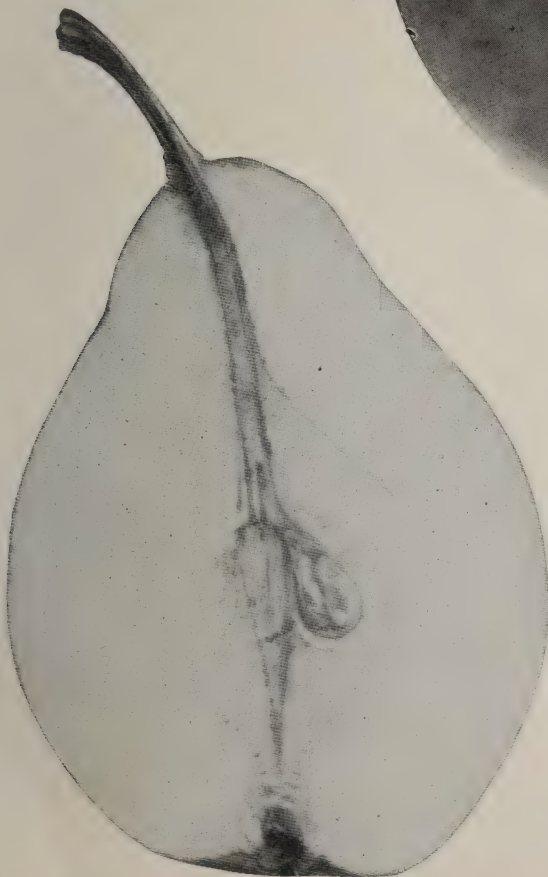
FLESH: creamy white; texture fine, tender, juicy with very agreeable flavor; good to very good.

QUALITY: good for dessert and cooking.

VALUE: first class for home market.

SEASON: August and September.

ADAPTATION: one of the hardiest pears.



SECTION OF CLAPP.



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COMICE (*Doyenne de Comice*).

“Tree large, upright. Fruit large, roundish pyriform, or broad obtuse pyriform; cavity shallow, often russeted; stalk short, stout, inclined; basin large, deep, uneven; calyx small, open; color greenish yellow, becoming clear yellow at maturity, often lightly shaded with crimson and fawn in the sun, and with light nettings and patches of russet and numerous russet dots; flesh white, juicy, melting, a little buttery with a fine texture, and sweet, rich, sprightly and aromatic flavor; quality good; season October to November; quite productive.” (*Report Mich. Exp. Sta.*)

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DEARBORN (*Dearborn's Seedling*).

Previous to the introduction of such choice early varieties as Chambers, Wilder, Giffard and Clapp, the Dearborn was highly commended. Downing calls it, “a very admirable early pear of first quality, succeeding Bloodgood, and preceding Bartlett;” but it is no longer to be commended for planting in the commercial orchard because of its small size. It is now considered only valuable in the garden of the amateur.

ORIGIN: at Boston, Mass., in 1818, by the Hon. H. G. S. Dearborn.

TREE: of moderate vigor; not subject to blight; very productive.

FRUIT: size small, roundish obovate; skin clear yellow with small grey dots, smooth; stem 1 to 1½ inches long, inserted with little or no cavity; calyx open in shallow basin.

FLESH: creamy white; texture tender, buttery, juicy; flavor agreeable.

QUALITY: dessert fair; cooking, good.

VALUE: market third-class.

SEASON: mid to end of August.

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## DEMPSEY.

The Dempsey was originated near Trenton in Prince Edward County, by Mr. P. C. Dempsey, the late well-known Director of our Association for that district. It was produced from a seed of a Bartlett, fertilized with Duchess d'Angouleme. The fruit is firm and consequently would ship well.

TREE: vigorous and productive.

FRUIT: large, oblong, obovate, pyriform; skin smooth, yellowish-green, with brownish-red cheek in sun; stem about 1 inch long, set in a fleshy base, and with almost no cavity; calyx nearly closed in a moderately deep uneven basin, core small.

FLESH: white, fine grained, tender, almost melting, with sweet, delicious flavor.

SEASON: late October to November.

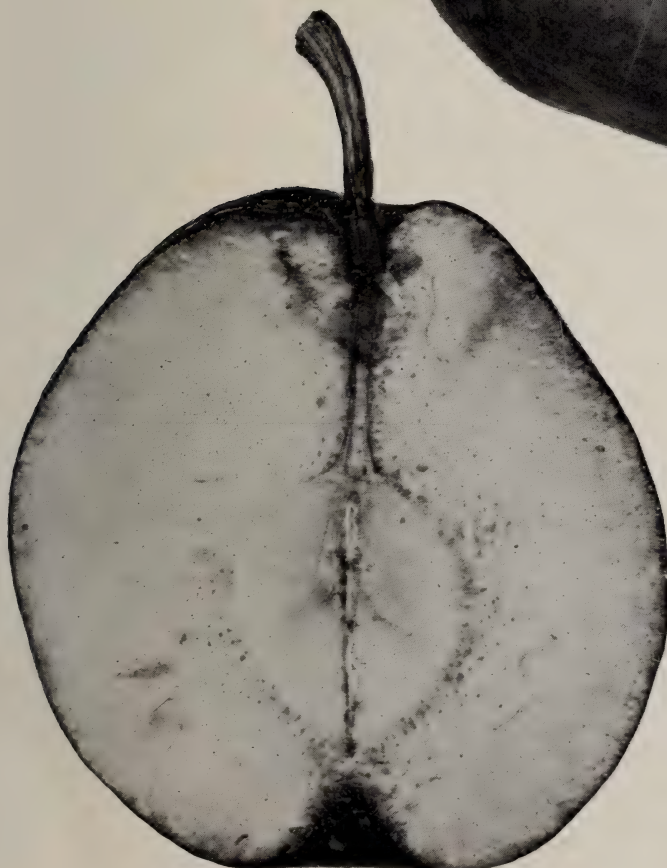
DIEL. (*Beurre Diel*.)

A pear of ordinary appearance as grown in Southern Ontario, but of such size and excellent quality that it deserves a place in every collection, whether for home use or market.

ORIGIN : a chance seedling near Brussels, Belgium, named in honor of Dr. Diel, a German pomologist.

TREE : very vigorous, hardy and productive.

FRUIT : large to very large ; obovate ; stem pale green, turning yellow at maturity, with numerous large brown dots and patches of russet ; stem curved, stout, from 1 to 1½ inches long, set in an open uneven cavity ; calyx open, in a basin of moderate depth and not very regular.



FLESH : cream color ; texture moderately fine, except at the core, juicy, buttery ; flavor aromatic, sweet and when well grown and well ripened, very delicious.

QUALITY : dessert very good.

VALUE : home market, second class, because lacking in color ; foreign market, possibly first class, because it carries well and has fine flavor, but not yet tested in this respect.

SEASON : November just preceding the Lawrence.



DROUARD (*President Drouard.*)

"Large, roundish ovate, obtuse, rather irregular; color yellow, with nettings and washings of russet; stalk quite stout, inserted in a deep, narrow, irregular cavity; flesh creamy white, tender, buttery, sweet, perfumed; good. An autumn variety much liked in Michigan and east of the lakes. Europe." (*American Horticultural Manual.*)

## DUCHESS.

(*Duchess d'Angouleme of LeRoy and Downing; Angouleme of American Pomological Society; Duchesse, common name in France.*)

For many years this pear has been counted among the best and most profitable varieties in Ontario, especially when grown on quince stock, and, in consequence has been largely planted. Prime samples are excellent stock for export, carried in cold storage. The fruit is often knotty from curculio stings.

ORIGIN: Angers, France, in 1812, a chance seedling. In 1820 Andusson, the propagator, sent a basket of the fruit to the Duchess d'Angoulême, who authorized him to bestow her title upon the pear as its name.

TREE: a strong grower, succeeds best on the quince; variable in productiveness; not subject to blight.

FRUIT: exceedingly variable in size, sometimes weighing a pound and a quarter; form obovate, large at the base; surface uneven, sometimes knobby; skin light green, patched with russet, and numerous grey dots; stalk stout, curved, 1 inch long, often swollen at point of attachment, deep set in an irregular cavity; calyx small, closed, in an uneven, often russeted basin.

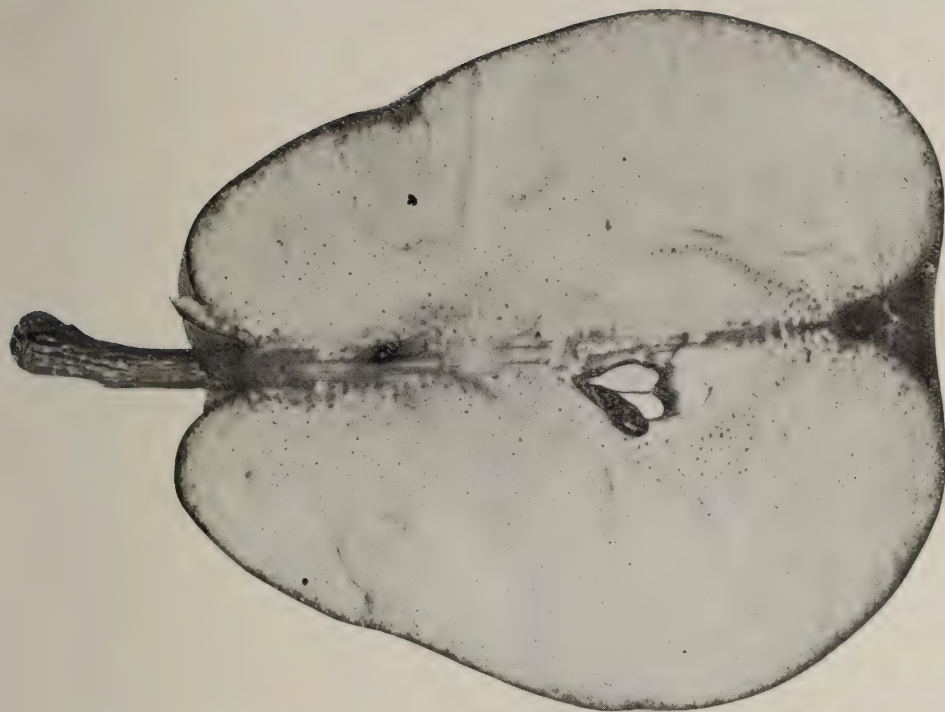
FLESH: white; texture fine when well grown, but often coarse grained, melting, juicy and, when properly matured, of a sweet and very good flavor.

QUALITY: dessert very good; cooking good.

VALUE: first class for either home or foreign market.

SEASON: October and November.

ADAPTATION: hardy in southern Ontario, but only half hardy in Grey, Bruce and York.



SECTION OF DUCHESS



DUCHESS



## EASTER BEURRE.

Among the desirable pears to grow for export we must not overlook the Easter Beurre, which, though green and unattractive in appearance at time of harvesting, keeps well through the winter, is an excellent shipper and is very good in quality. A warm climate and favorable soil seems to be necessary to its best development, and accordingly we find it planted for commercial purposes in the Californian pear orchards. On deep, rich sandy loam, in the southern parts of our Province, it succeeds well, either as a dwarf, or as a standard tree.

Although some writers have claimed that this pear originated in France, because some old trees were found near Laval, yet the majority agree that the variety originated in Belgium, at the old University town of Louvain. Van Mons, in his *Album de Pomologie* in 1847, says, "This variety was found in the ancient gardens of the Capucins, at Louvain, where the original tree still stood in the year 1825, under the name of *Pastorale de Louvain*."

In the old countries much confusion has existed regarding the names of pears, and subsequently much difficulty exists in the identification of varieties; this pear, for example, is given no less than twenty-four different names in LeRoy's *Dictionnaire de Pomologie*, as, for example, *Doyenne de Printemps*, *Canning*, *Beurre d'Hiver*, etc., the last being adopted by LeRoy; while Hogg, of England, and Downing, of America, both adopt the name so well known to us, *Easter Beurre*.

**TREE:** fairly vigorous, upright and productive, and may be grown either as a dwarf or as a standard tree; if as a standard, it needs good, rich soil and a warm climate for the best success. In Great Britain it does not seem to succeed so well as in Canada, for Hogg says it frequently happens that this delicious pear is of an indifferent and insipid flavor, which is caused by the unfavorable soil; and Blackmore, of Teddington, says, "It cracks in spots and is seldom very good." Our experience with it, as grown on a dwarf tree, is favorable.

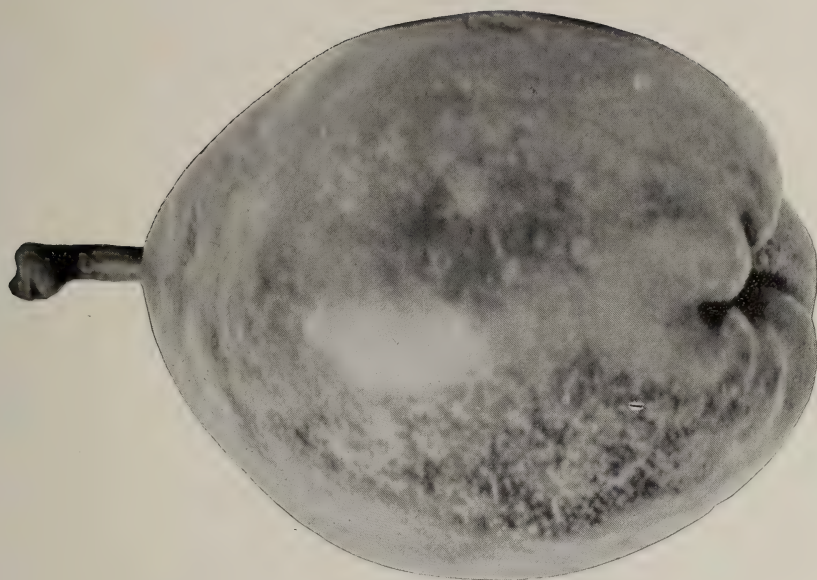
**FRUIT:** above the medium size, irregular obovate; skin pale green at harvesting time, yellowing somewhat toward maturity, with numerous russet dots, russet patches around the stem and calyx, and often a brownish cheek; stem about 1 inch long, stout, swollen at the base, set in a narrow, deep cavity; calyx small, closed, set in a much plaited basin of moderate depth.

**FLESH:** white, fine in texture, melting and juicy; flavor sweet, rich and agreeable.

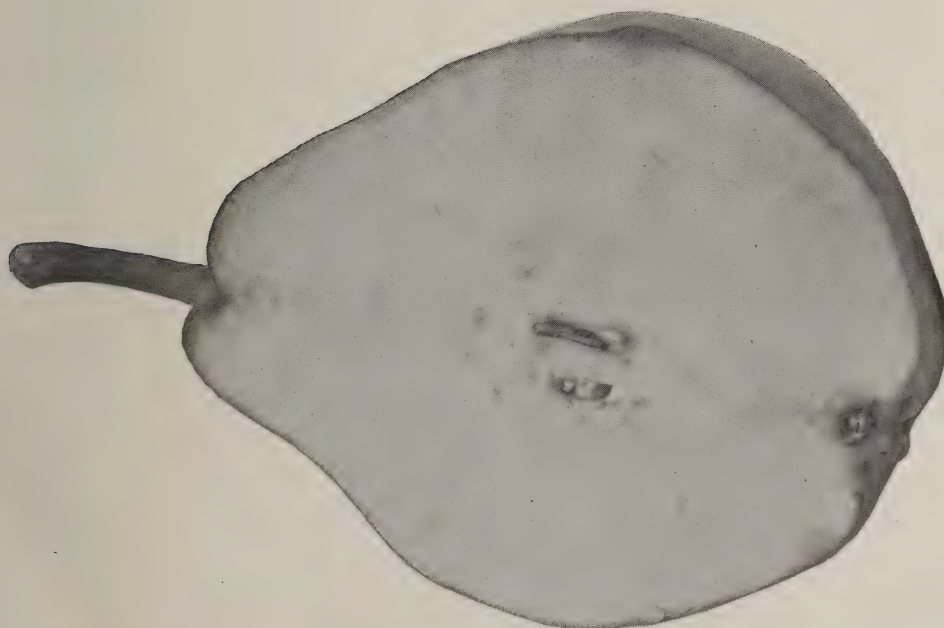
**QUALITY:** dessert good.

**VALUE:** export first class.

**SEASON:** mid to late winter.



EASTER BEURRE.



SECTION OF EASTER BEURRE.



FLEMISH BEAUTY (*Feodant des Bois. of LeRoy.*)

FLEMISH BEAUTY.

almost first in productiveness; an early bearer.

**FRUIT:** large, form obovate, obtuse, pyriform; skin light yellow when ripe, with frequent patches of brownish red on sunny side, with scattered minute dots; stalk 1 to 1½ inches long, set in a narrow, deep cavity; calyx open, segments short, in a small round basin.

**FLESH:** creamy white, melting, buttery, juicy; flavor rich, sugary, delicious.

**QUALITY:** first class.

**VALUE:** first class where well grown, but counted second class on account of its being subject to scab.

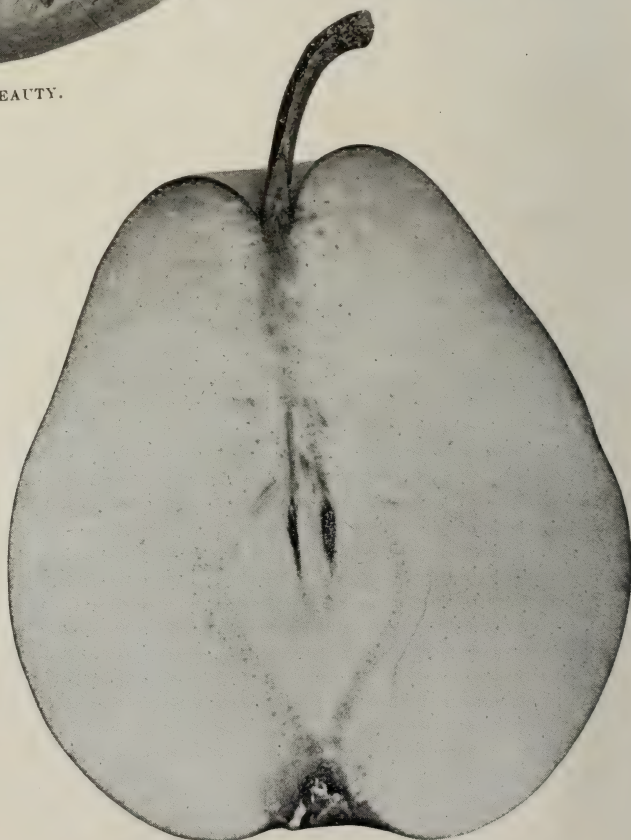
**SEASON:** mid to late September; should be gathered before quite ripe or it will drop and waste.

**ADAPTATION:** quite general; probably the hardiest good pear.

A variety that has been a great favorite in Europe ever since the beginning of the eighteenth century, as is evidenced by the thirty-five synonyms which have been given it as shown in "Dictionnaire de Pomologie" by Andre LeRoy. This and the Bartlett were among the first imported varieties of pears planted in Ontario, and it has been widely tested. In the northern sections where it succeeds, it is a most popular variety, but in southern Ontario it has been of late so subject to scab and cracking of the fruit, that it has lost favor with growers, notwithstanding its excellent quality.

**ORIGIN:** discovered by Van Mons about the year 1810 in Eastern Flanders, and distributed among his friends.

**TREE:** first class in hardiness;



SECTION OF FLEMISH BEAUTY.

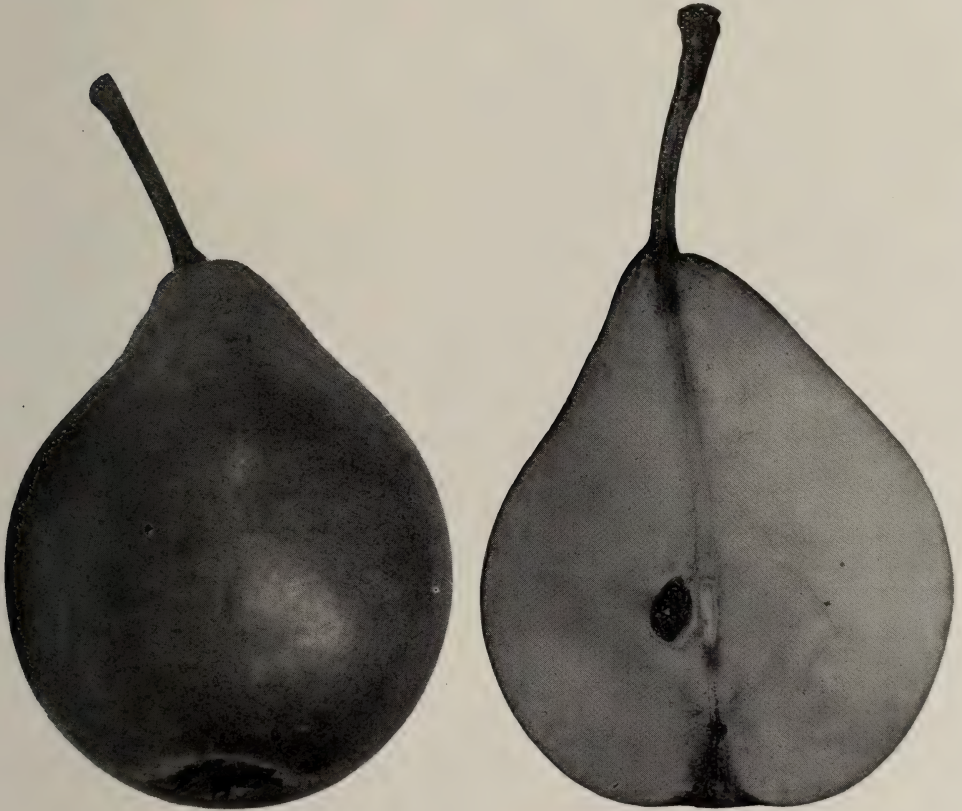
GIFFARD (*Beurre Giffard*).

A very desirable commercial pear for the home market.

Origin : a chance seedling about 1840, in the garden of M. Giffard, Angers, France.

TREE : fairly vigorous ; a straggling grower ; healthy ; fairly productive.

FRUIT : size, medium to large ; form pyriform conical ; color light green, with red dots and



GIFFARD.

SECTION OF GIFFARD.

marbling of red on the sunny side ; stem 1 inch long, stout, swollen at the base, set obliquely ; calyx half closed, in small, shallow basin.

FLESH : color white ; texture melting, juicy ; flavor vinous, perfumed.,

QUALITY : Dessert very good ; cooking best.

VALUE : first-class for home market.

SEASON : early to mid August.



## GOODALE.

A very good late fall pear; promising as a market variety.

ORIGIN: seedling raised by F. Good ale, Saco, Maine.

TREE: very vigorous and hardy and uniformly productive.

FRUIT: large, obovate obtuse pyriform; color green, yellowing at maturity, with crimson cheek, some russet patches, and some small brown dots; stem about 5-8 of an inch long, set in an inclined cavity; calyx small, closed, in a small, rather deep basin.



GOODALE.

FLESH: color white; texture fine, juicy, granular at core; flavor sweet, pleasant, perfumed.

QUALITY: dessert fair.

VALUE: market first class.

SEASON: October.

ADAPTATION: succeeds as far east as Bay of Quinte District.



SECTION OF GOODALE.

HARDY (*Beurre Hardy.*)

A good variety for the month of October, for both home use and market.

ORIGIN : Boulogne, France, dedicated to M. Hardy, director of the gardens at Luxembourg.

TREE : fairly vigorous and productive, and forms a fine symmetrical tree, especially when grown on the quince. The fruit is uniform in size and the skin is a bright clear russet.

FRUIT : medium size, form obovate, obtuse pyriform, of smooth regular outline ; skin yellowish green, with numerous russet dots and covered with light brown russet, especially at



HARDY.

the ends ; stem about 1 inch in length, stout, with fold at the base, and inserted obliquely in a small depression : calyx large, open, in a shallow basin ; flesh white, fine grained, buttery, juicy, with rich aromatic flavor.

QUALITY : dessert very good ; cooking good.

VALUE : home market first class.

SEASON : October.

10 F. O.



## HOWELL.

A good export pear for southern Ontario. Its vigor of tree, regularity of bearing, clear skin, and good size and quality make it a desirable variety for the commercial orchard.



HOWELL.

ORIGIN : New Haven, Conn. Named after the originator, Thomas Howell.

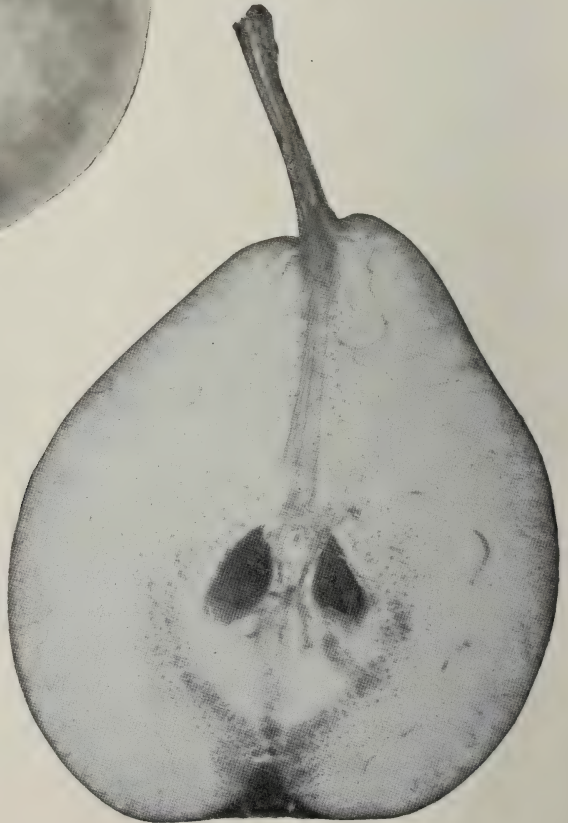
TREE : upright, healthy and vigorous, an early bearer, productive.

FRUIT : large, obovate pyriform ; skin yellowish green, waxen reddish dots on sunny side, russet dots in shade ; stem  $1\frac{3}{4}$  inches long, set on an acute base, without cavity, sometimes lipped ; calyx partly open in a deep russeted basin ; core small ; seeds few, small.

FLESH : creamy white, juicy, melting, granular near the core ; flavor agreeable, vinous ; a little tart.

VALUE : first class for all markets.

SEASON : mid September to mid October.



SECTION OF HOWELL.

## HOOSIC.

This promises to be an excellent commercial variety, with one fault, viz., its short season.

ORIGIN : seedling from Hacon's Incomparable, by Asahel Foote, of Williamstown, Mass.

TREE : on quince stock, healthy, vigorous and productive.

FRUIT : size large to very large ; form obtuse pyriform, somewhat one-sided ; skin yellow, with light red in sun, and with russet dots ; stem  $1\frac{1}{4}$  inches long, stout, curved, set in a small irregular cavity ; calyx small, open, set in a broad, uneven basin.

FLESH : white ; texture tender, fine and moderately juicy ; flavor rich, perfumed.

QUALITY : good for all purposes.

VALUE : first class for near market.

Grown at Maplehurst, as a dwarf, this pear has given the greatest satisfaction ; and, only that its season is rather short, it would be commended as an export variety.

SEASON : late September.

JOSEPHINE. (*Josephine de Malines*).

An excellent winter pear.

ORIGIN : Belgium.

TREE : succeeds well on the quince stock ; productive.

FRUIT : size medium, oblate conical ; color yellowish with small dots ; stem often two inches long in a slight cavity ; basin large.



JOSEPHINE.

FLESH : color yellowish white ; texture buttery ; flavor rich and peculiar.

QUALITY : dessert very good.

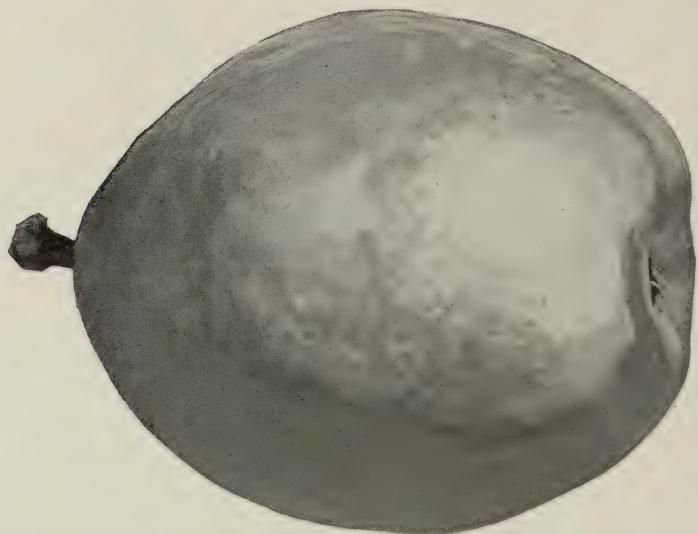
VALUE : market second class.

SEASON : midwinter.



## KIEFFER.

There is perhaps no pear about which a greater diversity of opinion exists ; some fruit men condemning it because of its lack of quality, and others insisting that its beauty of



KIEFFER.

appearance, its enormous productiveness, and its wonderful health and vigor of tree make it a profitable market variety, and that when properly grown and ripened it is quite a desirable kind, especially for cooking. Certainly the tree surpasses every variety in our collection for productiveness and vigor of growth ; while the fruit is always uniformly perfect in form, free from blemishes, and, when the tree is cultivated and manured, large in size.

ORIGIN : by Peter Kieffer, Roxbury, Pa., a seedling of Chinese Sand pear.

TREE : wonderfully vigorous and healthy ; an early and extraordinary bearer, often being laden with fruit after two years planting.

FRUIT : medium to large ; form ovate, tapering at both ends, widest at middle, and narrowest towards stem ; skin light golden yellow, with bright cheek, and very numerous brown russet dots ; stalk one inch long, fairly stout, in a one-sided cavity ; calyx half open, in a medium sized irregular basin.

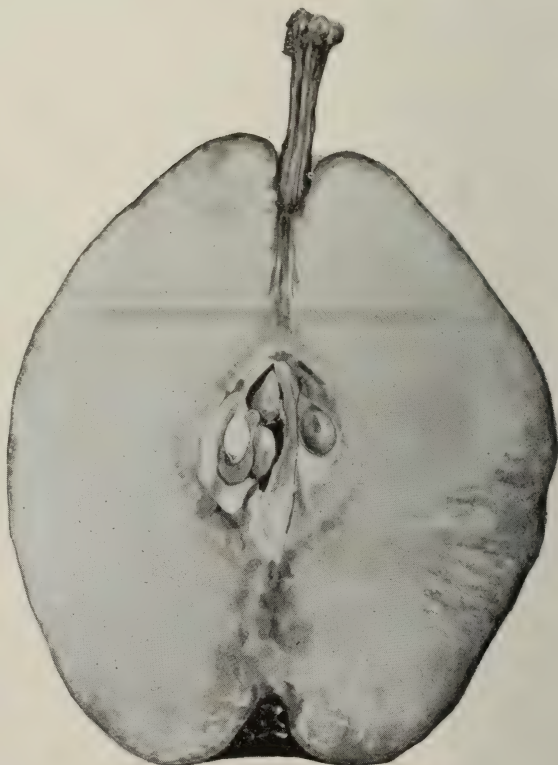
FLESH : yellowish white ; texture half tender, half melting, not very fine, juicy ; flavor moderately sweet, poor.

QUALITY : dessert very poor ; for cooking good ; valuable for canning.

VALUE : second class for all markets.

SEASON : October to January.

ADAPTATION : very general.



SECTION OF KIEFFER.

## KOONCE

Ordinary in its appearance, and only medium in size, but on account of the productiveness of the tree it is considerably planted in Illinois for kitchen and market.

ORIGIN : Illinois.

TREE : hardy, healthy and productive.

FRUIT : medium in size ; form obovate pyriform ; color of skin greenish yellow with small russet dots ; stem stout, 1 inch long inserted in a medium sized, shallow cavity.

FLESH : white ; texture granular ; flavor poor.

QUALITY : dessert poor ; cooking fair.

VALUE : for market second class.

SEASON : early October.

LAWSON (*Comet*.)

The most beautiful pear of its season, which is about the middle of August, but inclined to rot at core and become mealy if left hanging too long. Its flavor is disappointing, so that in spite of its beauty it is useless as a dessert pear. It has been widely advertised and too highly praised. In some parts it is grown as a cooking pear for home markets. For distant markets it is useless because too tender in flesh.

ORIGIN : on the farm of Mr. Lawson, in New York State, about the year 1800, judging from the appearance of the original tree, which was still standing in the year 1900. Quite recently, it was introduced to the public by Mr. Collins, under the name Comet, by reason of its bright red color.

TREE : tender, vigorous ; fairly productive ; succeeds on the quince.

FRUIT : medium to large ; obovate, almost pyriform ; color yellow, shaded and obscurely streaked with bright red on the sunny sides, with a few small brown dots ; stem  $1\frac{1}{2}$  inches long, with fleshy protuberance at point of insertion, inclined ; calyx half open in a large irregular basin.

FLESH : color, creamy white, coarse-grained, mealy when ripe, inclined to rot at the core ; flavor sweet, fairly good.

QUALITY : dessert good ; cooking good.

VALUE : market second class.

SEASON : early to mid August.



## LAWRENCE.

Probably the best dessert pear for use in early winter.

ORIGIN: Flushing, Long Island, according to Downing; New York State, according to Catalogue American Pom. Soc.

TREE: a moderate grower; an early bearer; moderately productive.

FRUIT: size medium to large; form obovate, obtuse pyriform; color lemon yellow, with numerous small dots; stem one inch long in a shallow cavity; calyx open in a small, five humped basin.



LAWRENCE.

FLESH: color yellowish white; texture buttery and juicy; flavor sweet, rich, aromatic, very excellent.

QUALITY: dessert best; cooking good.

VALUE: market second rate.

SEASON: December.

ADAPTATION: one of the hardy pears.

## LE CONTE.

An American pear grown for market in the Southern States. It is not considered profitable in Ontario.

ORIGIN: a Chinese seeding.

TREE: vigorous; productive; apparently not subject to blight.

FRUIT: large; form oblong, pyriform, turbinate; color yellow, often with slight touch of red on sunny side; skin free from blemishes, and not subject to scab.

FLESH: white; texture tender; flavor sweet, perfumed, ordinary.

QUALITY: dessert poor; cooking fair.

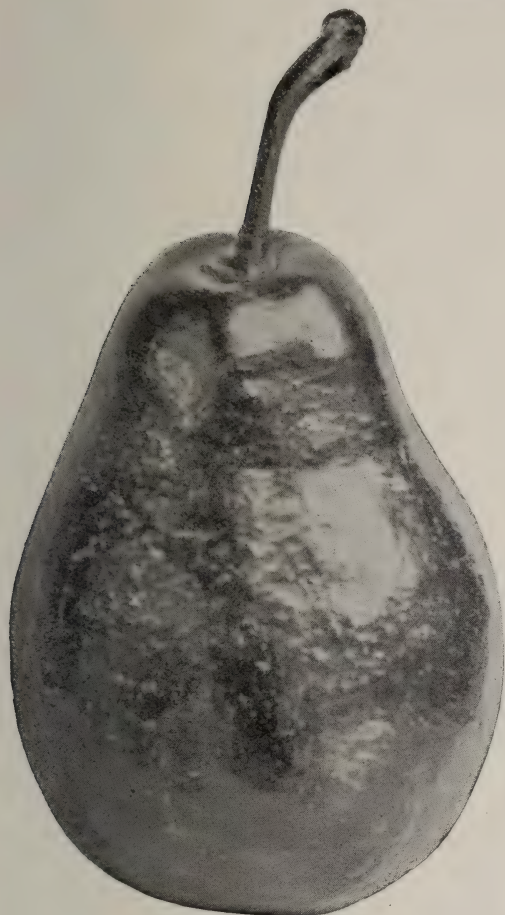
VALUE: second class for market.

LOUISE (*Louise Bonne de Jersey*).

An excellent export pear if well grown. This and the Duchess have long held the first place as market varieties with growers of dwarf pears in Ontario.

ORIGIN : at Avranches, France, about 1780, by Mr. Longueval, and named after Madam Louise de Longueval. About 1827, grafts were secured by Andre Leroy of Angers. The original tree is said to be still standing.

TREE : hardy in southern Ontario, succeeds better on quince than on pear stock ; a vigorous, upright grower ; very productive, if well cultivated and set in deep, rich sandy loam.



LOUISE.

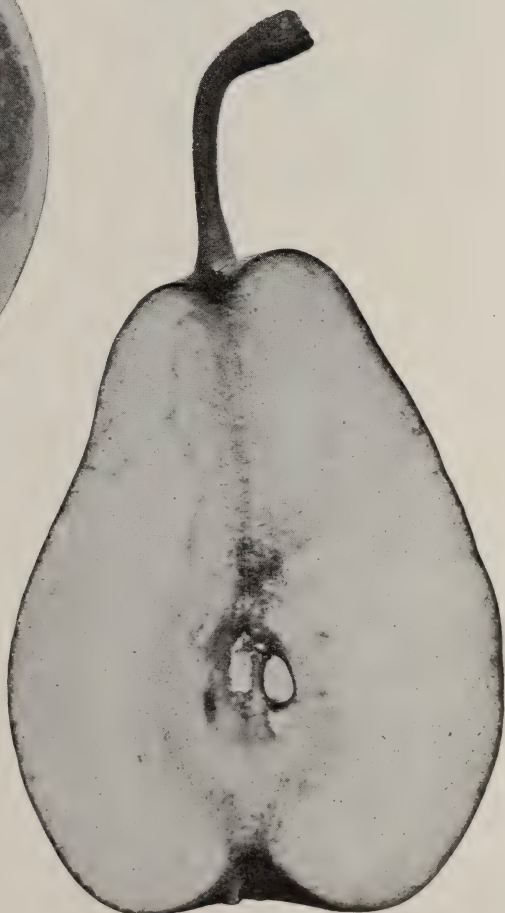
FRUIT : large ; form pyriform, sides usually unequal ; skin smooth, yellowish green with brownish red cheek, with numerous red and brown dots ; stem one to one and a half inches long, usually fleshy at insertion on one side, somewhat swollen at each extremity, set in a very slight, if any, depression ; calyx half closed, set in a wide, shallow, slightly plaited basin.

FLESH : white ; texture fine grained, juicy, buttery, melting ; flavor pleasant, aromatic.

QUALITY : very good for dessert purposes.

VALUE : home market, fair ; foreign market, first class.

SEASON : September to October.



SECTION OF LOUISE.

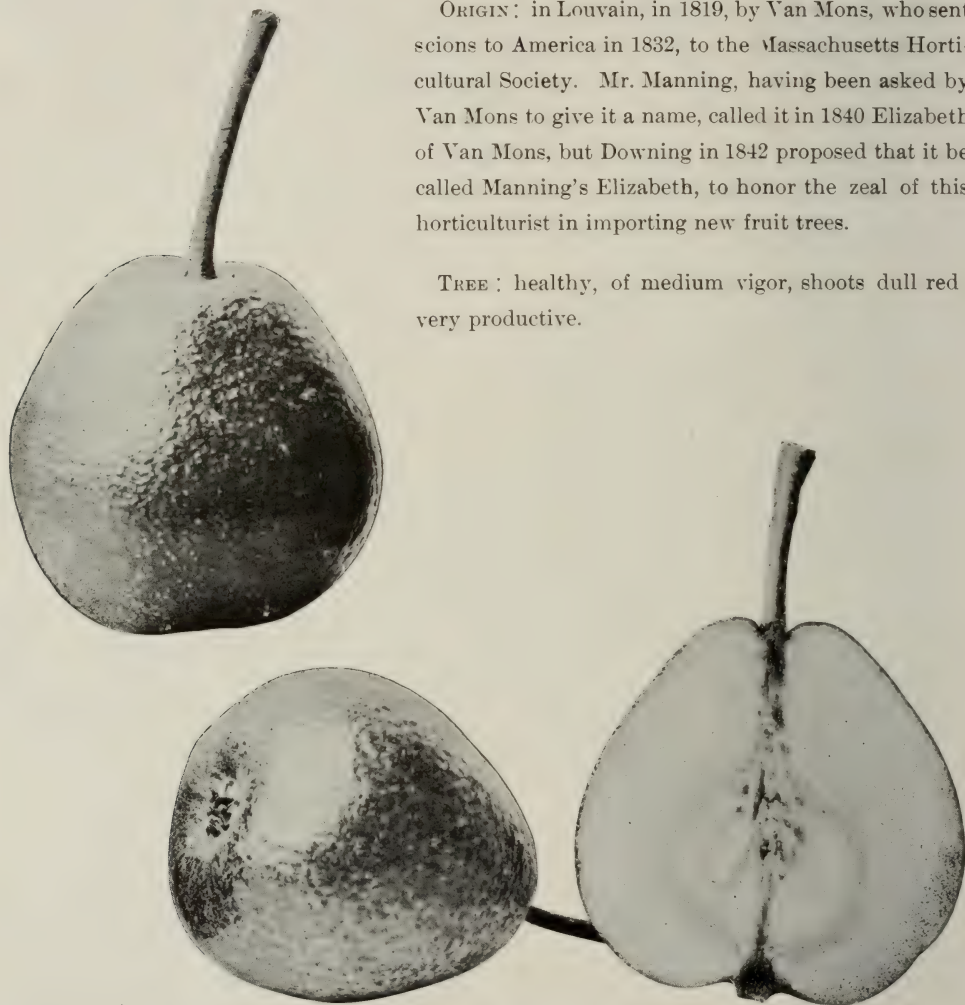


MANNING (*Manning's Elizabeth.*).

A pretty little pear, desirable in the amateur's garden, but too small for the commercial orchard.

ORIGIN : in Louvain, in 1819, by Van Mons, who sent scions to America in 1832, to the Massachusetts Horticultural Society. Mr. Manning, having been asked by Van Mons to give it a name, called it in 1840 Elizabeth of Van Mons, but Downing in 1842 proposed that it be called Manning's Elizabeth, to honor the zeal of this horticulturist in importing new fruit trees.

TREE : healthy, of medium vigor, shoots dull red ; very productive.



MANNING.

FRUIT : Size small ; form regular, obovate, swollen towards the base ; color bright yellow, covered on the basal half with a deep brownish red, which often spreads over the sunny side ; stem one inch in length, swollen at the top, often set in an oblique depression ; calyx open, set in a shallow basin.

FLESH : color creamy white ; texture fine, buttery, moderately juicy ; flavor sweet, rich, aromatic.

QUALITY : very good for dessert or pickling.

VALUE : second class for market purposes.

SEASON : August.

MARGUERITE (*Petite Marguerite*.)

Among the desirable varieties of dessert pears for the home garden we would certainly include the *Petite Marguerite*, a pear of the highest quality for table use. At Maplehurst the tree has proved itself an abundant bearer and a good grower. The fruit is not large, but as size is not an object in a dessert pear, this is not a fault. Its season is immediately after the *Giffard* and just before the *Clapp* and the *Tyson*. As a market pear it is hardly to be commended, because of its small size and color; and it will be a long time before we can convince the average dealer that size and color are not the chief considerations in a fruit.

ORIGIN: Angers, France, in nurseries of Andre LeRoy.

TREE: second rate in vigor, and first rate in productiveness: succeeds as either standard or dwarf, but more vigorous as a standard.

FRUIT: small size to medium; form oblate, obtuse pyriform; skin light green, often tinged and mottled with bright red on sunny side, yellowing somewhat at maturity; stalk  $1\frac{1}{4}$  inches to  $1\frac{1}{2}$  inches in length, set in a narrow cavity, of which one side is often much higher than the other; calyx partly open, in a shallow corrugated basin.

FLESH: white, yellowish at core; texture fine, melting, juicy; flavor sweet, vinous, agreeable.

QUALITY: very good for dessert, good for cooking.

VALUE: home market, second class.

SEASON: August.

OSBAND (*Osband's Summer*.)

Widely grown in [North America. A good dessert pear for home garden, but the fruit is small and the tree is too scant a bearer to be profitable.

ORIGIN: Wayne County, New York State.

TREE: a moderately upright grower, healthy, fairly productive, an early bearer.

FRUIT: size small; form obovate, slightly pyriform, regular; color yellowish green, turning quite yellow at maturity, with a brownish red cheek and numerous small green and brown dots; stem  $\frac{7}{8}$  of an inch long, set in a small, abrupt cavity; calyx half open, in a broad, slightly depressed basin; core small; seeds small.

FLESH: color white; texture fine-grained, juicy; flavor perfumed, sweet, rich and pleasant.

QUALITY: dessert very good; cooking fair.

VALUE: home market second class; distant market fourth class.

SEASON: August.



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PITMASTON (*Pitmaston Duchess d'Angouleme.*)

A very promising variety, succeeding well as a dwarf ; its large size, good shipping character, fine quality, and regular form, seem to make it very valuable for export. The fruit is too large to be grown as a standard.

ORIGIN : raised by John William, of Pitmaston, England ; a cross between Duchess and Glout Morceau.

TREE : a very vigorous grower, and quite productive.

FRUIT : very large, oblong, obovate, obtuse, pyriform, ; skin pale yellow, with light russet in cavity ; stem stout,  $1\frac{1}{2}$  to  $1\frac{3}{8}$  inches long, set in a small cavity ; calyx prominent, half open, set in a very shallow, shouldered basin.

FLESH : color creamy white ; texture very fine, melting and juicy ; flavor very pleasant, aromatic, sometimes slightly astringent.

QUALITY : Good, not quite equal to that of Duchess.

VALUE : first class for market.

SEASON : September and October.

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PRESIDENT MAS.

A large, handsome winter pear.

ORIGIN : France.

TREE : a moderate grower ; does best on quince stock.

FRUIT : size large ; form obovate pyriform, irregular ; skin yellow at maturity.

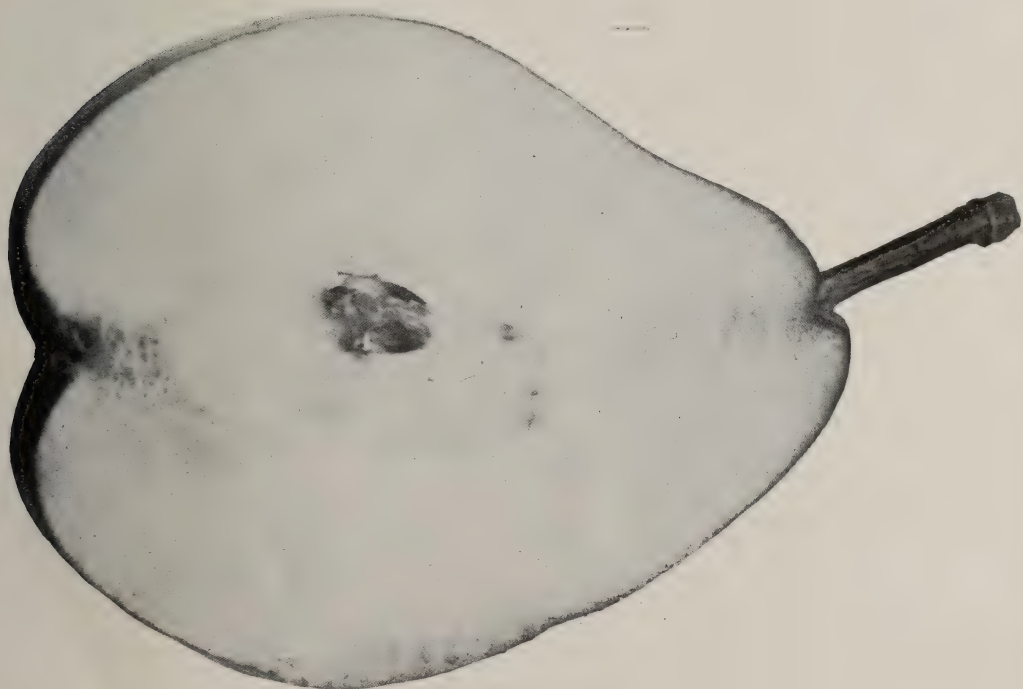
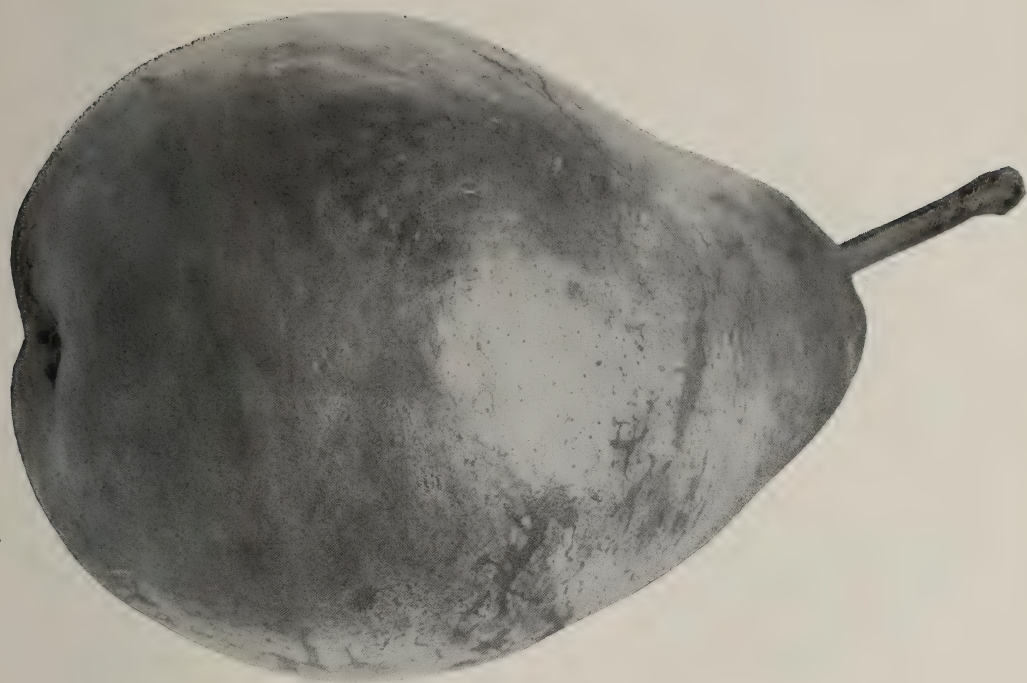
FLESH : white ; texture melting, juicy ; flavor vinous, very good.

QUALITY : dessert first rate.

VALUE : market apparently first class.

SEASON : December to January.

PITMASTON.





## RITSON.



Ritson.

A delicious dessert pear, which is worthy of a place in every fruit garden ; it is not surpassed for canning or for pickling, having an aroma and peculiarly agreeable flavor.

Origin : Oshawa, Ontario, with Mr. Wellington. In response to our inquiry, Mr. W. E. Wellington writes :—" It was my grandmother Mrs. John Ritson, who planted the seeds from a pear which had been sent her from Boston. The tree has always stood on my grandfather's homestead as long as I can remember."

Tree : strong, healthy, upright grower. The original tree is now of immense size, probably over 30 feet high, and about one hundred years old. An annual bearer of nice, evenly formed fruit.

Fruit : size medium, form obovate pyriform, usually one-sided ; color of skin yellow, heavily shaded with golden russet, and numerous minute dots of a darker russet ; stem one-inch long, often inserted in a fleshy protuberance, and at a slight inclination ; calyx open wide in a very shallow, regular basin.

Flesh : creamy white ; texture fine, tender, buttery, juicy ; flavor, sweet, delicately perfumed.

Quality : dessert very good to best ; cooking very good.

Value : market promising for a special trade.

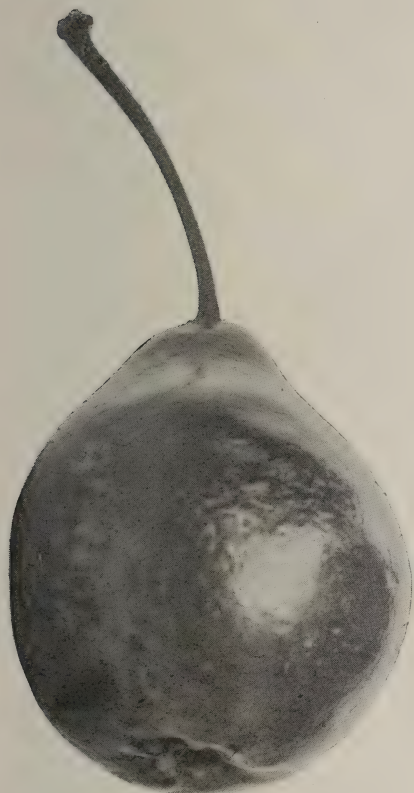
Season : October.



SECTION OF RITSON.

## ROSTIEZER.

A small unattractive looking pear, of very high quality. It is the best of its season in quality for dessert purposes, and should have a place in the home garden. What the Seckel is in October, this pear is in August. The pear sells far below its value on account of its ordinary appearance.



ROSTIEZER.



SECTION OF ROSTIEZER.

TREE : healthy, vigorous, of sprawling habit ; shoots few, and need shortening in.

FRUIT : small to medium, obovate, oblong pyriform ; skin green, sometimes turning yellowish, with reddish-brown cheek ; stem slender and nearly two inches in length ; calyx open ; basin small.

FLESH : juicy, melting, sweet, very delicious, of very finest quality.

VALUE : market, third class.

SEASON : mid to late August.



## SECKEL.

The finest dessert pear in cultivation, and one that should never be omitted from the garden, when planting pears for home use. Downing calls it "The richest and most exquisitely flavored variety known." At Maplehurst it has been grown both as a dwarf and as a standard; in the former case with the most satisfactory results, but in the latter, smaller, less highly flavored and less attractive in appearance.

Its small size rules it out of the commercial orchard, unless one can cultivate a very special demand among a certain class or consumers who will appreciate its high quality.

ORIGIN: on the farm of Mr. Seckel, of Philadelphia, near the Delaware river, where in 1884, the original tree was still standing, aged one hundred years and having reached the height of thirty feet. The Seckel was first introduced into England, into the garden of the Royal Horticultural Society in 1819.

TREE: healthy, hardy, and productive; forms a compact symmetrical head; wood olive brown in color, stout and short jointed; succeeds best as a dwarf.

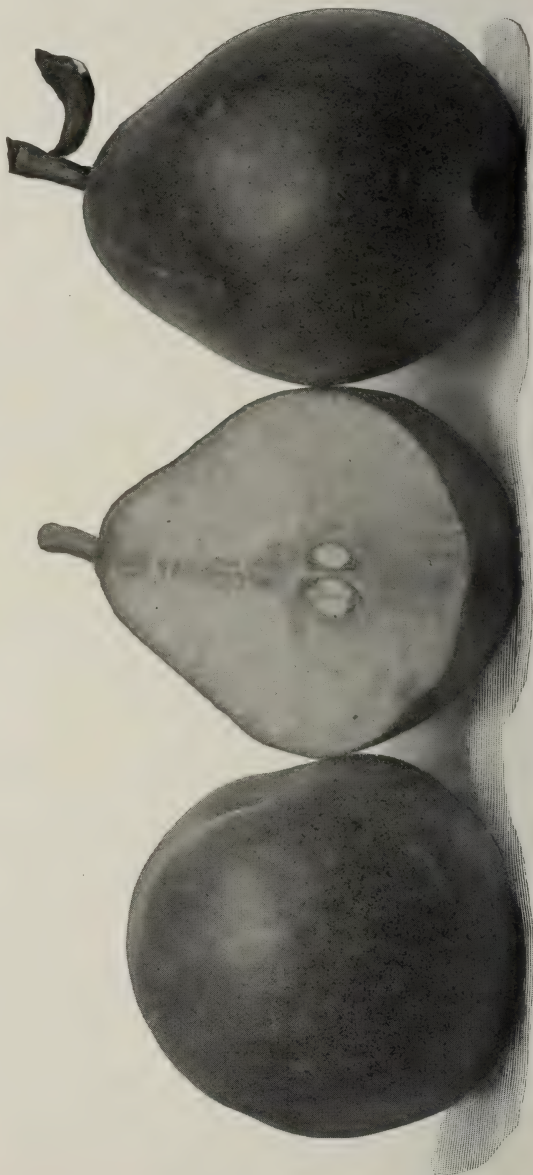
FRUIT: size small, form obovate, regular and even; color dull brownish green, yellowing as it ripens with a deep brownish red cheek; stem half an inch in length, in a very small cavity; calyx small, open, in a shallow basin.

FLESH: white; texture very fine grained, melting and juicy; flavor honey-sweet; rich spicy, with delicate aroma.

QUALITY: dessert best; cooking good.

VALUE: first class for a special market; but second class where not known, on account of its small size.

SEASON: September to October.



## SHELDON.

One of the most delicious of dessert pears, if eaten just at the proper time. Worthy of a place in every home garden, but not productive enough to be planted for market.

ORIGIN : accidental on farm of Norman Sheldon of Huron, Wayne Co., N.J.

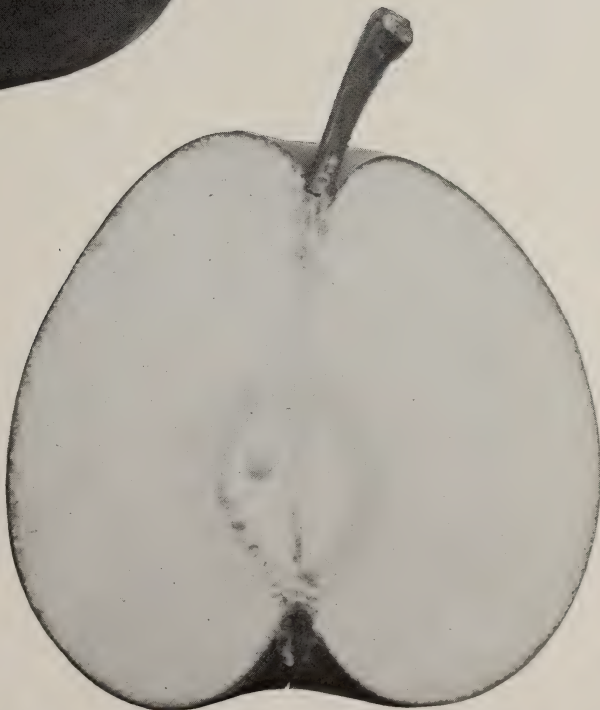
TREE : vigorous, erect, not very productive, late coming into bearing.

FRUIT : above medium in size, roundish, obtuse obovate ; skin yellowish-green, covered with

thin light russet, brownish crimson in sun, russet dots ; stalk short, stout, in a narrow cavity ; calyx nearly open, in a broad basin.

FLESH : color creamy ; texture buttery, juicy ; flavor sweet, aromatic.

SEASON : October.





## SAPIEGANKA.

A Russian pear of fine appearance, scions of which were sent out to Mr. L. Woolverton in 1892, by M. Jaroslav Niemetz, of Winnitza, Podolie, Russia. Its fine appearance is in its favor, but its quality is inferior to other varieties of its season, and, unless it should prove desirable on account of its hardiness, would not be worthy of general cultivation. Mr. Niemetz says, "In its home in Lithuania, old and large trees are met with which have endured many and severe winters in the Tamboff Government. It is the most hardy of all pears there grown, and, therefore, is certainly a hardy variety. The flavor of the flesh depends upon local conditions, for, though it is tasteful enough in the warmer districts, it is sometimes harsh; when grown in the north is juicy and buttery."

TREE : hardy, productive, but subject to blight.

FRUIT : size medium, oblate, often somewhat flattened; color brownish yellow, with brownish red in sun, with numerous small dots; stem long in small cavity; calyx segments large, partly open in a broad, wrinkled basin.

FLESH : white; texture coarse, somewhat firm and juicy.

QUALITY : dessert poor; cooking poor.

VALUE : market third class.

SEASON : August.

ADAPTATION : succeeds well at Grimsby. Tested by the Dominion Experimental Farms and found tender in Manitoba and the Northwest, but perfectly hardy at Ottawa and in Muskoka.

SOUVENIR (*Souvenir du Congres.*)

A very large, showy pear, but coarse in flesh and of ordinary quality. Single trees are found in many Ontario fruit gardens, but so far we know of no orchards of this variety planted for profit. Hogg, the British pomologist, however, speaks of it more highly, as follows:—"A very handsome and excellent pear; ripe in the end of August and the beginning of September. It has a great resemblance to the Williams (Bartlett), but is quite a distinct fruit."

ORIGIN : France, by M. Morel, of Lyon-Vaise, and dedicated to the Pomological Congress at France.

TREE : vigorous and productive, pyramidal.

FRUIT : very large, form oblong obovate, undulating in outline; color clear yellow when ripe, with a red cheek and many brown dots; stem  $\frac{3}{4}$  of an inch long, stout, much inclined, inserted without a cavity; calyx large, open, set in a deep basin.

FLESH : color white; texture tender, but coarse, juicy, melting; flavor rich, vinous, aromatic, somewhat resembling that of Bartlett.

QUALITY : dessert fair; cooking not tested.

VALUE : home market first class.

SEASON : late September and early October.

ADAPTATION : not widely tested in Ontario.

SUMMER DOYENNE (*Doyenne d'Ete of Hogg*; *Doyenne de Juillet of Le Roy*.)

For the home garden this pear is most desirable, not only for its good quality for dessert purposes, but because it has no competitor in the last half of July. It should be gathered before it is mellow to preserve its juiciness, for, if ripened on the tree, it becomes mealy and insipid. Its very small size makes it undesirable in the commercial orchard, especially now that we must compete with larger varieties from California, which ripen earlier in that climate than they do with us.



ORIGIN : Dr. Van Mons, Professor at Louvain, Belgium, about 1823, at which time he had on his grounds about 2,000 seedlings of merit.

TREE : vigorous young shoots, light yellowish brown, of upright slender habit ; an early and abundant bearer ; succeeds as dwarf or standard.

FRUIT : small, form roundish, obovate ; color green to lemon yellow with brownish red cheek on the sunny side, and numerous grey dots ; stalk about an inch long, sometimes longer, stout, attached in a very slight depression ; calyx small, half open, in a shallow plaited basin.

FLESH : white ; texture fine, tender, juicy ; flavor sweet and pleasant with slight aroma.

QUALITY : dessert very good ; too small for cooking.

VALUE : too small for a market pear, except in limited quantities.

SEASON : July.

ADAPTATION : hardy in Southern Ontario ; fairly hardy in Bruce and Huron.



TRIUMPH.

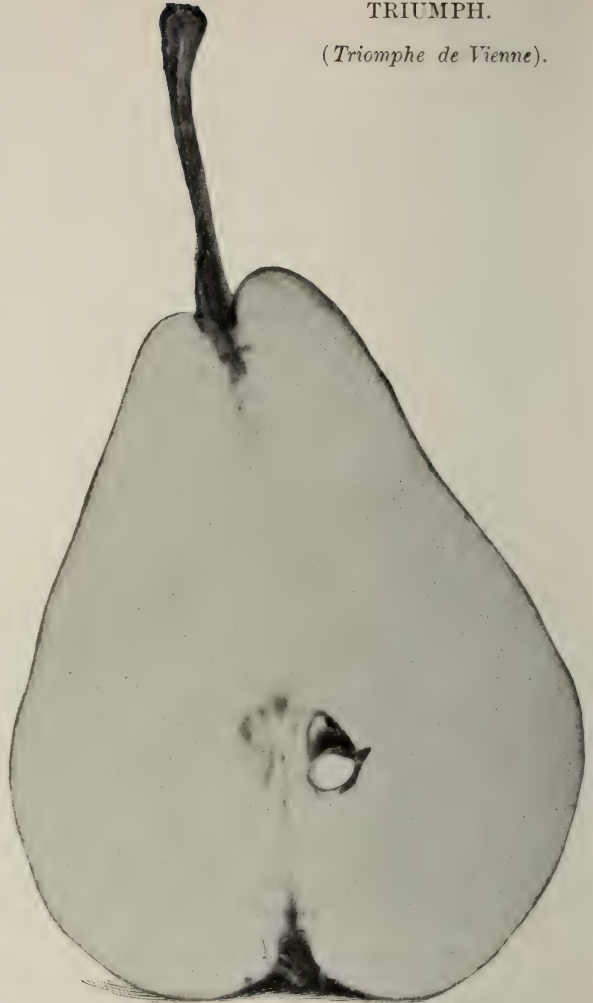
(*Triomphe de Vienne*).

A very fine, large, showy pear, a trifle later than Bartlett, larger in size, but not equal to it in quality; promising as a commercial variety.

ORIGIN: France.

TREE: a thrifty, upright grower; productive.

FRUIT: large; form obovate, pyriform, somewhat uneven and irregular; skin greenish yellow, with patches of russet; stem one and a quarter inches long, set in a shallow, uneven, often one-sided cavity; calyx open, in a broad, irregular, russeted basin.



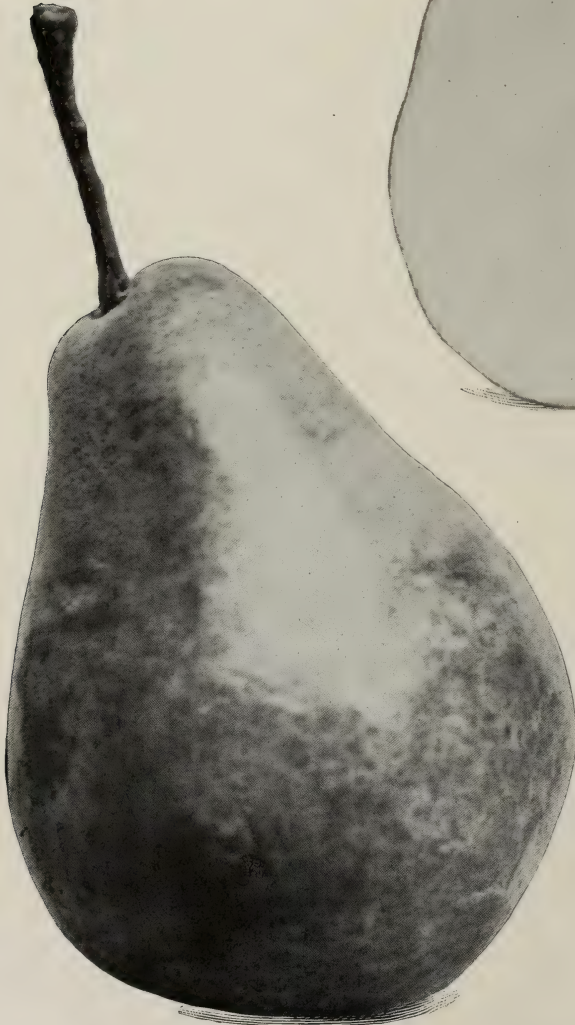
SECTION OF TRIUMPH.

FLESH: creamy white, very juicy; flavor rich, sweet and excellent.

QUALITY: dessert very good; cooking very good.

VALUE: market, home or foreign, first class.

SEASON: September.



TRIUMPH.

## TYSON.

A fine pear yielding enormous crops of medium sized fruit, very good for dessert or cooking ; but too near the season of the Bartlett to be profitable for market.

ORIGIN : a seedling found in a hedge on the farm of Jonathan Tyson, near Philadelphia.

TREE : vigorous ; upright ; very productive.

FRUIT : size medium ; form acute pyriform ; color green, turning yellow when fully ripe, russet about basin, cheek crimson, dots brown, numerous ; stem  $1\frac{1}{4}$  inches long more or less, fleshy at base ; calyx open.



TYSON.

FLESH : color white ; texture tender, buttery, fine grained, juicy ; flavor sweet, aromatic, excellent.

QUALITY : dessert very good ; cooking very good.

VALUE : home market second class.

SEASON : August.



VICAR (*Vicar of Winkfield of Hogg; Cure of Leroy.*)

A French pear considerably grown in Ontario as a winter pear, but it does not reach its best perfection in our climate and does not deserve a place in our orchards.

ORIGIN: found wild near Clion, France, by M. Leroy, curate of Villiers-en-Brenne, in the year 1760; distributed in France under sixteen different names; introduced into England by the Rev. W. L. Rham, vicar of Winkfield, in Berkshire, hence its English name.

TREE: vigorous, but somewhat susceptible to blight; very productive.

FRUIT: large; form long pyriform, one-sided; skin green, seldom tinged with brown on the sunny side, and marked with small brown dots; stem usually one and a half inches long, fleshy at base, and inserted obliquely without a cavity; calyx open, with large segments, set in a shallow basin.

FLESH: greenish white; texture firm, not very juicy as grown in Ontario; flavor fair, if well ripened.

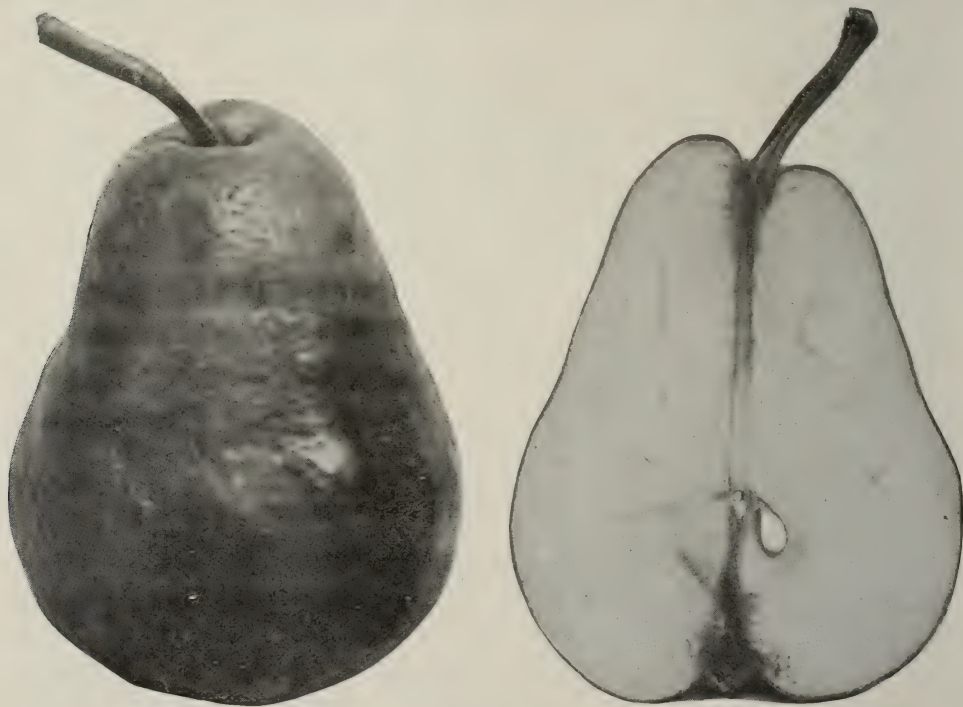
QUALITY: dessert very poor; cooking fair.

VALUE: home and foreign market second class.

SEASON: early winter.

## WILDER.

A valuable early market pear, being beautiful in appearance, of fair size and very good flavor; probably the best of its season, but inclined to rot at the core if left hanging on the tree.



WILDER.

ORIGIN: chance seedling on south shore of Lake Erie.

TREE: vigorous, very productive, and an early bearer when grafted on the quince.

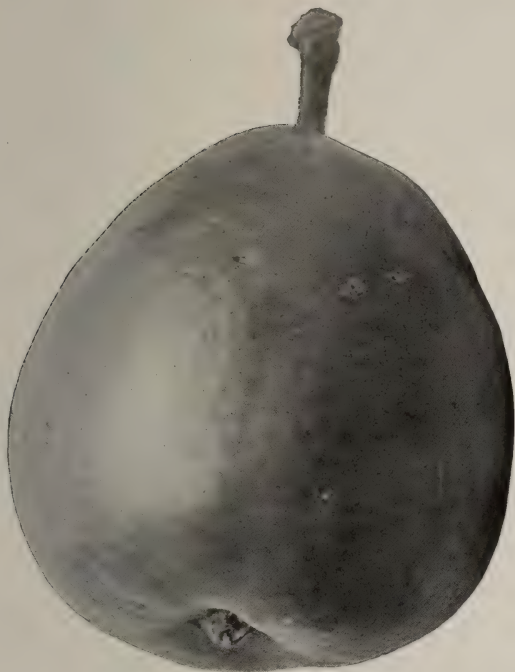
FRUIT: fair to large in size; form ovate, obtuse pyriform, sometimes shouldered at stem; color greenish yellow, with deep red cheek and numerous gray dots; stem stout, three quarters to one inch in length; calyx open.

FLESH: white; texture tender, fine grained; flavor sweet, aromatic and very pleasant.

QUALITY: dessert very good.

VALUE: home market first class.

SEASON: August.

WHITE DOYENNE (*Virgalieu of New York State.*)

An old variety with many French synonyms, of which the proper one according to LeRoy is *La Doyenne*. Downing speaks of it as "unquestionably one of the most perfect of autumn pears," and on account of its excellent quality and the productiveness of the tree, it was at one time widely planted in the commercial orchards of Ontario and the United States. Latterly, however, like the *Flemish Beauty*, it has become subject to black spot, for which reason it is losing favor.

Origin : France.

TREE : healthy, not subject to blight ; a fairly vigorous grower, and an abundant bearer ; usually grown as a standard.

FRUIT : size medium to large, form obovate, variable in length ; skin green at first, changing to yellow as it ripens, sometimes red in the sun, sprinkled with numerous russet dots ; stem  $\frac{3}{4}$  of an inch long, set in a shallow cavity ; calyx half closed in a shallow slightly plaited basin.

FLESH : white ; texture fine grained, buttery, fairly juicy ; flavor sugary, aromatic, perfumed.

QUALITY : dessert very good ; cooking very good.

VALUE : market second class.

SEASON : September and October.





## WINTER NELIS.

An old variety of excellent quality, which has long occupied a high place as a winter dessert pear to succeed the Lawrence; scarcely large enough nor attractive enough to be highly recommended for the commercial orchard.

ORIGIN: raised by Jean Charles Nelis, of Malines, in Belgium; introduced into England in 1818.

TREE: a spreading, straggling, stocky grower; should be topworked; hardy; an early bearer; very productive.



WINTER NELIS.

FRUIT: size small to medium; form roundish obovate, short pyriform; color of skin dull green, becoming yellowish green with dots and patches of brown russet; stalk about one and a quarter inches long, curved, set in a narrow cavity; calyx open, with erect segments, in a shallow, somewhat plaited basin.

FLESH: color yellowish white; texture fine grained, buttery, juicy; flavor rich, sugary, vinous, aromatic.

QUALITY: dessert very good to best; cooking good.

VALUE: market second class.

SEASON: early to mid winter.

## THE PLUM.

The plum has a wider range over the Province of Ontario than the pear or peach, this fruit being a native of the Province and found as far north as Manitoba.

There are three large groups into which the plums may be divided here, namely, the European, Japanese, and American. In the European or domestica group are included most of the varieties which are grown in Ontario commercially. These plums are not as hardy as the natives, hence their profitable culture is limited to almost exactly the same districts as the pear, the commercial orchards being mostly found in southern Ontario, the Georgian Bay District, and along Lake Ontario west of the Bay of Quinte. A few of the hardiest produce crops occasionally in eastern Ontario and up to about latitude 45 degrees in central Ontario, but they are too uncertain to be grown for profit.

The Japanese plums are grown over practically the same area as the European, but the fruit buds average a little more tender.

In the American group are included the Americana and Nigra plums, the former being derived from a hardy United States species and the latter from the native Canadian plum. The varieties of this group are quite hardy and can be grown commercially where the European and Japanese plums will not succeed, and while not so good in quality as the others, good prices are at present obtained for what are produced.

Plums are not being so extensively planted at present as other large fruits, since during recent years the markets have several times been glutted, resulting in low prices. The demand for plums is, however, always large, and the excellent market which is opening up in the North-west will probably in the future prevent, in a great measure, this over-supply.

The cultural directions for the apple will apply in most particulars to the plum, which will succeed on almost all kinds of well drained soils, although it does best on the heavier clay loams. Trees one or two years of age should be planted about eighteen feet apart each way, the soil having been thoroughly prepared beforehand. The trees should be severely headed back when planted, and future pruning will consist in forming a well shaped open head. As some varieties make exceptionally strong growth it is a good practice when the trees are young to prune the young growth back about one-half each spring to avoid splitting. When the trees begin to bear little pruning is necessary, as they usually bear so heavily that the trees do not make much growth annually.

Orchards should be kept thoroughly cultivated, and cover crops are recommended as for the apple, cherry, peach and pear. The fruit should be picked when it is well colored but still firm.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

##### *Commercial and Domestic:*

*American:* These are extremely hardy and are desirable where the European and Japanese varieties cannot be grown: Aitkin, Cheney, Bixby, Mankato, Wolf, Hawkeye, Stoddard.

*European:* Bradshaw, Imperial Gage, Gueii, Shipper Pride, Lombard (liable to over bear, requires thinning), Quackenboss, Yellow Egg, Grand Duke, Coe, Reine Claude (one of the best for canning).

*Japanese:* These are apparently quite as hardy as the European varieties: Red June, Abundance, Burbank, Chabot, Satsuma (red fleshed, desirable for canning).



## DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Lake Huron District:* By A. E. Sherrington, Walkerton, Ont.

*Commercial and Domestic:* Red June, Ogon, Burbank, Bradshaw, Imperial Gage, Gueii, Shipper Pride, Victoria, Quackenboss, Yellow Egg, Monarch, Grand Duke, Satsuma.

*Georgian Bay District:* By John Mitchell, Clarksburg.

*Commercial and Domestic:* Red June, Burbank, Washington, Bradshaw, Imperial Gage, Quackenboss, Arch Duke, Diamond, Monarch, Yellow Egg, Coe, Satsuma, Reine Claude.

*Burlington District:* By A. W. Peart, Burlington, Ont.

*Commercial:*

*European:* Bradshaw, Imperial Gage, Lombard, Yellow Egg, Glass, Reine Claude.

*Japanese:* Red June, Abundance, Burbank, Chabot, Satsuma.

*Domestic:* Abundance, Saunders, Bradshaw, Imperial Gage, Smith Orleans, Lombard, Yellow Egg, Satsuma, Reine Claude.

*Niagara District:* By Linus Woolverton, Grimsby, Ont.

*Commercial:* Red June, Burbank, Bradshaw, Chabot, Gueii, Coe, Quackenboss, Satsuma, Reine Claude.

*Domestic:* Abundance, Washington, Yellow Egg, Shropshire, Quackenboss, Satsuma, Reine Claude.

*St. Lawrence District:* By Harold Jones, Maitland, Ont.

*Domestic:*

**NOTE.**—The *European* and *Japanese* varieties are only recommended for the home garden in the *St. Lawrence District*, as they have not proved entirely hardy nor very productive.

*American:* Milton, Whitaker, Hammer.

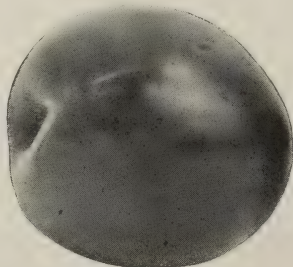
*European:* Gueii, Lombard, Shipper Pride, Glass.

*Japanese:* Red June, Burbank.

## DESCRIPTION OF VARIETIES.

## AITKEN.

"Fruit large, oval; cavity narrow, medium depth; suture obscure; apex pointed; color uniformly deep red all over; dots none; bloom none; skin thin; flesh deep yellow, juicy, moderately sweet, not rich or high flavored; stone large, flat, oval, semi-cling,



AITKEN.

no astringency; quality medium to above; season last week of August. Tree only fairly productive. Nigra group. The earliness of this plum is the principal point for recommendation." (Macoun).

## ABUNDANCE.

One of the best of the Japan plums for the home garden. It is early in season, being ripe about the middle of August, but matures unevenly. To get its best flavor it should be picked while still firm, and ripened indoors like a Bartlett pear; it will color beautifully, become very juicy, and the flavor will be sweet and rich.

ORIGIN : one of Luther Burbank's importations from Japan in 1884.

TREE : vigorous ; productive, a six year old tree, at our Lake Huron fruit station, bearing six 12-quart baskets of fruit in 1901 ; habit upright.



ABUNDANCE.

FRUIT : size medium to large ; form roundish, narrowing toward the apex ; color bright red on a yellowish ground with numerous red dots ; stalk strong, three-quarters of an inch long, inserted in a narrow, deep cavity ; suture shallow, distinct ; apex pointed ; pit oval ; a partial cling.

FLESH : color yellow ; texture tender, very juicy ; flavor sweet and delicious.

QUALITY : dessert fair ; cooking poor.

VALUE : market, second class.

SEASON : mid August.

## ARCH DUKE.

A good market variety.

ORIGIN : imported from England, by S. D. Willard, Seneca, N. Y.

TREE : Domestica.

FRUIT : size large ; form oval, necked ; stem medium, stout ; cavity deep, medium ; color dark blue with many russet dots ; bloom bluish, heavy ; suture more than half round.

FLESH : yellowish ; cling ; texture meaty, juicy ; flavor subacid, pleasant.

QUALITY : cooking very good.

VALUE : first class in some localities.

SEASON : late.

## ARCTIC.

The tree is hardy and the fruit is of some value where the better varieties do not succeed. It is very productive, but too small to bring the best prices in the market, especially in view of its ordinary quality.

ORIGIN : Maine.

TREE : hardy ; fairly vigorous ; productive ; trees at our Lake Huron station, eight years planted, yielded from six to eight baskets each.

FRUIT : size small, form oval ; color very dark purple, with thin blue bloom ; suture traceable ; stem slender, three quarters of an inch long, set in a small cavity.

FLESH : color yellowish green ; texture firm, moderately juicy ; flavor moderately sweet ; free stone.

QUALITY : dessert useless ; cooking good.

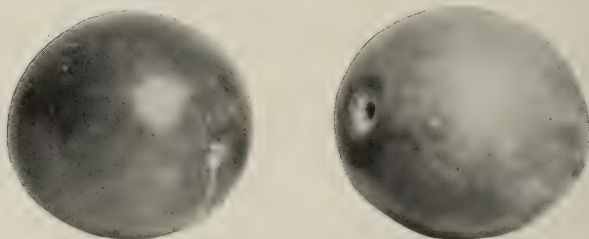
VALUE : market second to third class.

SEASON : mid August to early September in southern parts of the Province, and early September in more northerly plum districts.



## BIXBY.

"Fruit above medium to large, roundish; cavity narrow, medium depth; suture rather indistinct, slightly depressed; apex rounded; color yellow, more or less covered with bright red; dots numerous, small, yellow; bloom fairly heavy; skin moderately thick, rather tender; flesh deep yellow, juicy; stone medium size, oval in outline, considerably flattened, cling; sweet but not rich in flavor, no astringency; quality good; season late, August to early September. A very handsome early plum. Chief fault is unevenness of ripening. Makes good preserves." (*Macoun*).

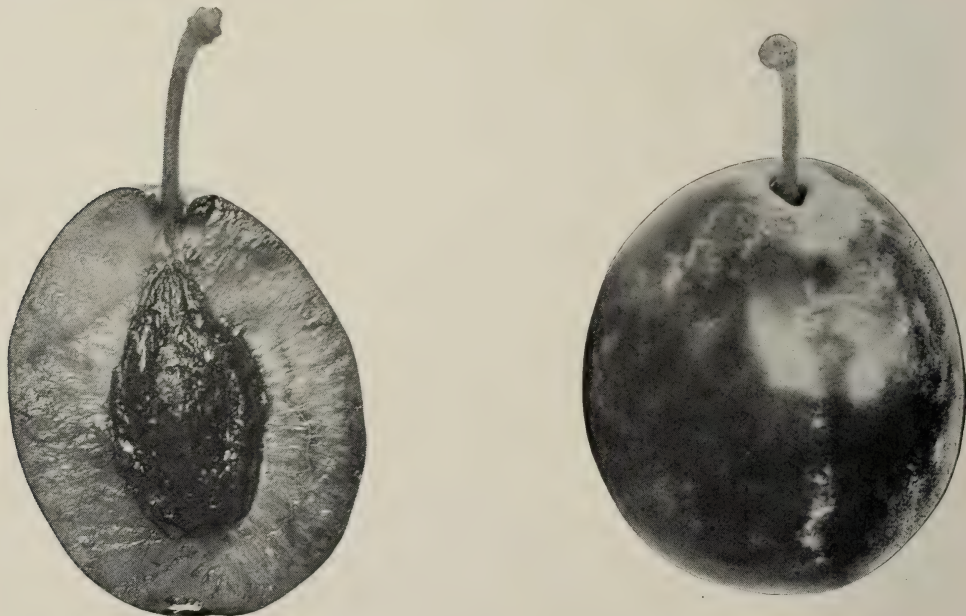


BIXBY.

BRADSHAW (*Niagara, Blue Imperial.*)

Considered by many one of our most valuable European varieties whether for home use or market, because of its fine quality, its large size and beautiful appearance.

TREE: erect, vigorous, moderately productive with occasional heavy crops; late coming into bearing; class, Domestica.



BRADSHAW.

FRUIT: size large; stalk one inch long, slightly curved; color reddish-purple, with blue bloom; apex round, slightly depressed; suture on one side, broad and shallow.

FLESH: color yellowish; texture juicy, tender; flavor rich and sweet; pit long, thin oval, partial cling.

QUALITY: dessert very good; cooking very good.

VALUE: home market first class.

SEASON: mid to late August.

## BURBANK.

The Burbank is one of the best of the Japanese plums for the commercial orchard, on account of its beauty, its great productiveness, and its excellent shipping quality.

ORIGIN : It was in 1885 that Mr. Luther Burbank of Santa Rosa, California, imported some plum trees from Japan and, when they fruited, he selected this as one of the best and most worthy of propagation. In 1891 he sent samples to the Department of Agriculture at Washington and the Pomologist of the Department named it Burbank, after the introducer.

This plum has been before us for ten years and notwithstanding the great number of Japanese varieties now sold by nurserymen, still holds the highest place.

Compared with the Domestica class, the Japanese are inferior in quality, but, when fully ripened, are fairly good eating. Like the Kieffer pear, the Burbank plum is making its reputation rather on quantity than on quality.

TREE : hardy ; a very vigorous, wayward grower, making a very badly shaped tree, unless severely headed back and kept within bounds ; an early and most abundant bearer ; the fruit needs thinning to secure good size.



BURBANK.

FRUIT : medium to large ; form when properly thinned, nearly round, but slightly conical ; color orange yellow ground, shaded with red, and almost purple on the side exposed to the sun ; skin very smooth, with a slight bloom, peels easily when ripe ; suture traceable ; apex a small point ; stem half to five-eighths of an inch long, stout ; cavity deep abrupt, with leather-crack marks.

FLESH : color amber ; texture juicy and tender when fully ripe ; flavor sweet, fairly agreeable ; stone medium, pointed, cling.

QUALITY : good for cooking ; fair for dessert.

VALUE : first class for market.

SEASON : late August.

ADAPTATION : general ; succeeds fairly well on St. Joseph Island.

## CLIMAX.

A very large, fine looking Japan plum ; a fine market variety.

ORIGIN : Hybrid of P. Simoni and Botan, raised by Luther Burbank of Santa Rosa, California.

TREE : vigorous ; productive.

FRUIT : size very large ; form heart shaped, one sided ; color vermillion, with numerous white specks.

FLESH : cling ; color yellow ; texture firm, juicy ; flavor rich, aromatic.

QUALITY : dessert good ; cooking not tested.

VALUE : market first class.

SEASON : mid August.



CHABOT (*Yellow Japan, Bailey.*)

This is the best Japan plum of its season, which is about two weeks later than Burbank.

ORIGIN : imported from Japan by Mr. Chabot, of Berkeley, Cal., and introduced to the trade by Mr. Luther Burbank in the year 1896.

TREE : very vigorous, head fine, large, symmetrical ; productive ; an early bearer.

FRUIT : medium to large for a Japan plum ; form oblong-conical, almost heart shaped ; color red, with pinkish bloom and numerous minute yellowish specks ; stem three-quarters of an inch long, stout ; apex a point in a narrow, deep depression ; suture traceable.



CHABOT.

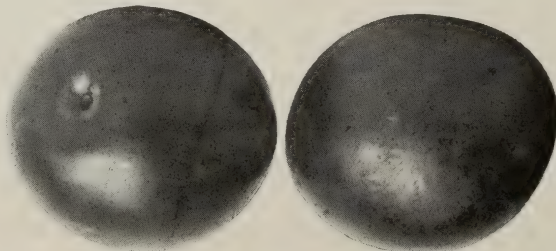
FLESH : color yellowish ; texture moderately firm and juicy ; flavor sweet, perfumed ; very pleasant ; clings to stone.

QUALITY : dessert good ; cooking and drying very good.

SEASON : early to mid September.

## CHENEY.

"Fruit large, round to somewhat oval, uneven ; cavity narrow, medium depth ; suture merely an indistinct line ; apex rounded ; color uniformly deep red all over, sometimes paler on one side ; dots none ; bloom none ; skin moderately thick, tough, not astringent ; flesh deep yellow, juicy ; stone medium size, flat, oval, cling ; sweet, moderately rich flavor ; quality good. Season late August to early September. One of the best. It soon gets soft, however, after ripening. Tree a strong grower, moderately productive. Nigra group." (*Macoun*).



CHENEY.

COE. (*Coe's Golden Drop*).

A popular canning plum for the home garden; scarcely productive enough to be recommended for the commercial orchard.

ORIGIN: England.

TREE: vigorous; fairly productive; class Domestica.

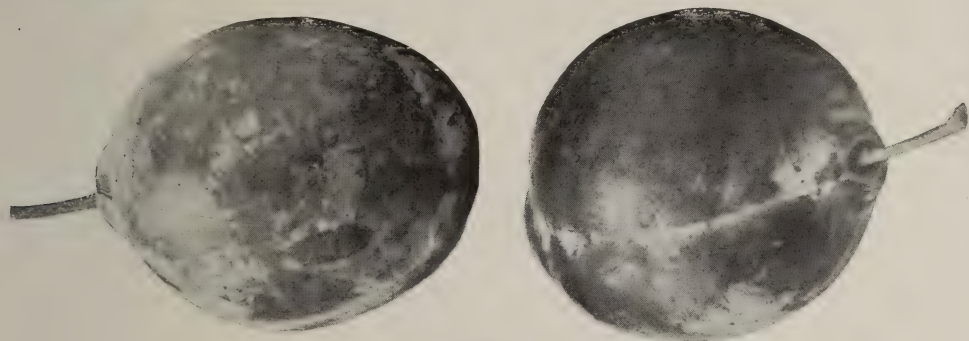
FRUIT: large; form oval; suture distinct; neck short; sides unequal; color golden yellow with dots of red next the sun; bloom yellow; stalk three-quarters of an inch long, stout, in a shallow cavity.

FLESH: cling; color yellowish; texture firm, not fine grained; flavor sweet and pleasant.

QUALITY: cooking very good; dessert fair.

VALUE: market first class.

SEASON: mid September.



COE.

DIAMOND (*Black Diamond*.)

Considerably grown for cooking purposes.

ORIGIN: Kent, England.

TREE: vigorous; productive; class Domestica.

FRUIT: size large; form oval; suture distinct, shallow; stem three quarters of an inch long in a narrow, deep cavity; dots small; color dark purple with pale blue bloom.

FLESH: cling; color deep yellow; texture coarse grained, dry; flavor brisk acid.

QUALITY: dessert poor; cooking good.

VALUE: market first class.

SEASON: September.

DUANE (*Duane's Purple*.)

A good commercial plum, a profitable variety in the Western States.

ORIGIN: Duaneburgh, N. Y.

TREE: vigorous, productive.

FRUIT: very large; form oblong, oval longer on side; color reddish purple with lilac bloom, turning dark blue; stalk slender, three quarters of an inch long set in a narrow cavity.

FLESH: color yellow; texture tender, juicy; flavor moderately sweet and good; partial clingstone.

SEASON: late August to early September.

QUALITY: cooking good.

VALUE: market first class.



## GERMAN PRUNE.

Highly valued for shipping to distant markets because it keeps and carries well ; valued also for drying and preserving.

ORIGIN : Germany ; widely grown over Europe.

TREE : fairly vigorous ; productive ; may be propagated from seed without much variation.

FRUIT : size medium, sometimes below ; form long oval, sides unequal, elongated ; suture distinct : stem three-quarters of an inch long, curved, inserted without cavity ; color purple, with blue bloom.

FLESH : free from pit ; color yellowish green ; texture firm ; flavor sweet, pleasant, not rich.

QUALITY : dessert poor ; drying good.

VALUE : near market second class ; distant market second class.

SEASON : September and October.

GLASS. (*Glass' Seedling*).

A commercial variety resembling Quackenboss.

ORIGIN : with Alexander Glass, at Guelph, Ontario.

TREE : hardy ; vigorous ; habit upright ; foliage peculiar dark green ; productive ; class *Domestica*.

FRUIT : size large ; form round oval, irregular at apex ; suture distinct ; apex depressed ; stem three-quarters to one inch long ; color dark purple with thin blue bloom and white dots ; skin thick, firm.



GLASS.

FLESH : free from pit ; color greenish yellow ; texture juicy ; flavor sweet and agreeable.

QUALITY : dessert fair ; cooking good.

VALUE : market good.

SEASON : September.

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GOLD.

A very attractive plum, because of its golden yellow color, but not recommended for the commercial orchard.

ORIGIN: a hybrid of Chickasaw and Japan, originated by H. A. Terry, of Crescent, Iowa.

TREE: a poor grower, but an early and abundant bearer.

FRUIT: large roundish; color golden yellow, with a blush of light red about the stem; stem three-quarters of an inch in length; skin tough.

FLESH: yellow; texture tender and juicy; flavor sweet, aromatic, and pleasant; clingstone.

QUALITY: dessert, fair.

VALUE: market second class.

SEASON: late August.

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## GRAND DUKE.

A valuable market plum, on account of its large size and handsome appearance.

ORIGIN: Europe.

TREE: healthy; moderately vigorous; quite productive.

FRUIT: size large; form obovate; color dark blue or black, with dark blue bloom; stem about one inch long, in a small cavity; suture deep.



GRAND DUKE.

FLESH: color yellow; texture firm, flavor agreeable; cling.

VALUE: one of the best late market plums.

SEASON: late September.

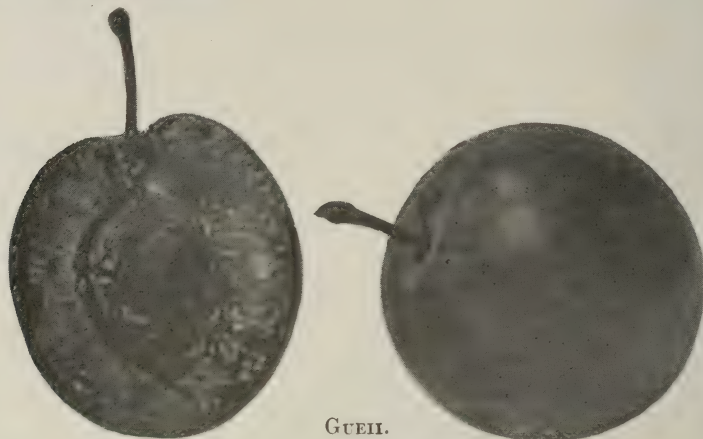


GUEII. (*Blue Magnum Bonum*).

A valuable plum for the commercial orchard; the fruit is very subject to rot; in the southern parts of the Province.

ORIGIN: with Mr. Hagaman, Lansingburgh, N. Y., about 1850. It was named after John Goeway (pronounced Gueii), who was the first to cultivate the plum extensively, and it has of late been spelled after the pronunciation.

TREE: an upright, vigorous grower, becoming more spreading with age; hardy; an early and abundant bearer.



GUEII.

FRUIT: size, medium to large; form, roundish ovate, narrowing slightly toward apex; color very dark purple, with blue bloom; stem one and a half inches long, slender, set in a large, deep cavity; suture very slight; apex a small point.

FLESH: color pale yellow; texture firm, juicy; flavor, moderately sweet, pleasant; almost free of stone.

QUALITY: dessert, poor; cooking, very good.

VALUE: home market first class.

SEASON: late August to early September.

## HALE.

A yellow Japan plum, coming in between Abundance and Burbank.

ORIGIN: Japan; imported by Luther Burbank in 1885; named after the introducer, Mr. J. H. Hale.

TREE: very vigorous; habit spreading; very productive in 1905.

FRUIT: size rather above medium, form globular; suture traceable on one side; color of skin orange, with thin whitish bloom; stem slender, three-quarters of an inch in length; drops easily.

FLESH: color golden yellow; texture tender, juicy; flavor rich, pleasant; cling.

QUALITY: dessert good; cooking very good.

VALUE: market second class.

SEASON: mid to late August.

HAND. (*General Hand*).

A very fine, large plum of the Gage group, which is worthy of a place in the amateur's garden as a dessert or preserving plum, but not profitable as a market variety.

ORIGIN: on farm of General Hand, Lancaster, Pennsylvania.

TREE: a very vigorous grower, but a shy bearer; class *Domestica*.

FRUIT: round; size medium to large; skin deep golden yellow, marbled with greenish yellow; stem slender, about an inch long, inserted in a shallow cavity; suture shallow.

FLESH: color pale yellow; texture coarse, moderately juicy; flavor sweet and very good; free from stone.

QUALITY: very good for either dessert or cooking.

VALUE: market first class.

SEASON: September.

## HAMMER.

"Fruit round oval; size medium to large; cavity very shallow; suture a line; color crimson; dots many, minute, and a few larger yellow; bloom blue; skin thick; flesh yellow; stone small, round, slightly flattened, nearly free; quality very good; season after Wolf and Weaver. Originated with H. A. Terry, Iowa, who says it is a seedling of Miner, but thinks it has an admixture of Americana blood. A fine variety." (*Wagh*).

## HAWKEYE.

FRUIT: large, roundish; cavity shallow, narrow; suture merely a distinct line; apex rounded; color yellow, more or less covered with purplish red; dots small, indistinct; bloom medium; skin thick, moderately tough.

FLESH: deep yellow, juicy; stone large, broad, much flattened, cling; sweet, good flavor.

QUALITY: good.

SEASON: mid to late September. One of the best. (*Macoun*).



HAWKEYE.

ITALIAN PRUNE. (*Fellenburg*).

An old variety from Europe; a fine late shipping plum, and widely grown for market.

ORIGIN: Europe.

TREE: of spreading habit; productive; class *Domestica*.

FRUIT: size medium; form oval, narrowing at the ends, one sided; stem one inch long in small cavity; suture shallow; skin thin; color dark purple with blue bloom.

FLESH: free stone; color greenish yellow; texture fairly juicy; flavor sweet, good.

QUALITY: dessert fair; cooking very good.

VALUE: market first class.

SEASON: September.

12 F.O.



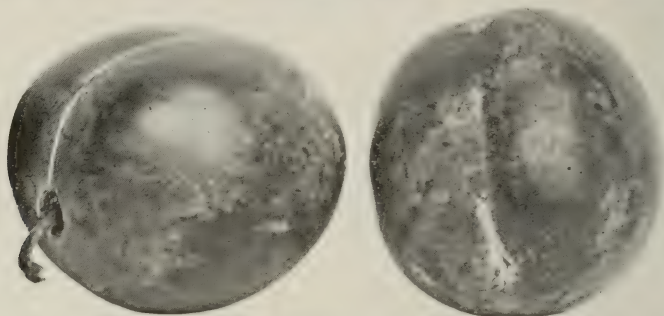
## IMPERIAL GAGE.

An excellent preserving or canning plum, but not very popular for the commercial orchards.

ORIGIN: Flushing, Long Island.

TREE: vigorous; productive; hardy; class Domestica.

FRUIT: size medium or below; form oval; color green tinged with yellow; dots greenish; bloom whitish; stem three-quarters of an inch long; suture shallow; skin tough.



IMPERIAL GAGE.

FLESH: mostly free; color greenish yellow; texture juicy, melting; flavor rich, excellent.

QUALITY: dessert good; cooking best.

VALUE: market first class.

SEASON: early September.

## KINGSTON.

A valuable market variety.

ORIGIN: Province of Ontario.

TREE: vigorous and productive.

FRUIT: size medium to large, form oval; color dark purple, with thin blue bloom; stem slender, about five-eighths of an inch long, inserted in a small, deep cavity; suture shallow; apex a small point.

FLESH: color yellowish green; flavor tart.

QUALITY: cooking, very good.

SEASON: early September.

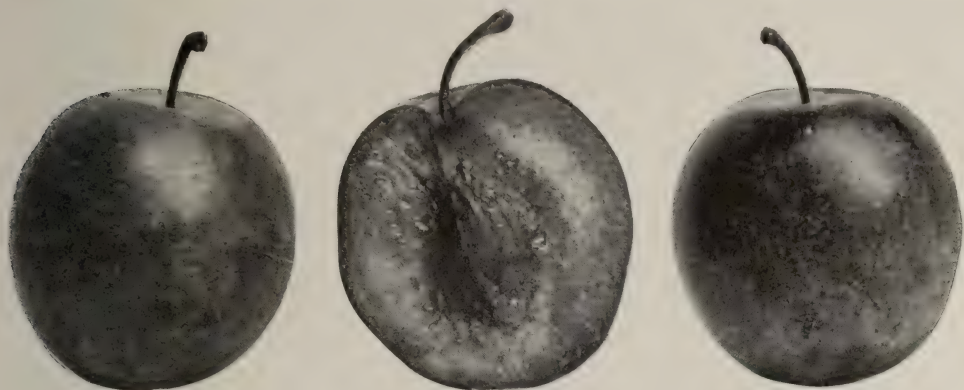
## LOMBARD.

One of the most prolific of the old varieties, and, until recently, considered the most profitable. Of late, however, the price of Lombard plums has so far declined that other varieties are being planted in its place.

ORIGIN: raised from seed by Judge Platt, Whitesboro, N. Y.; introduced to public by M. Lombard, of Springfield, Mass., after whom it was named. Previously it was called Bleeker's Scarlet.

TREE: very productive; very vigorous; very hardy; inclined to overload, and the fruit needs thinning.

12a F. O.



LOMBARD.

**FRUIT:** medium size; form roundish, oval, slightly flattened at the ends; color purplish red, paler in shade; bloom heavy; suture traceable; stalk slender, about three-quarters of an inch, set in a broad, funnel-shaped cavity; subject to rot when overloaded.

**FLESH:** deep yellow; texture firm, juicy; flavor pleasant; cling stone.

**QUALITY:** dessert, good; cooking, very good.

**VALUE:** second class for market.

**SEASON:** late August to early September.

#### McLAUGHLIN.

A fine plum for home uses; a little tender for distant shipment.

**ORIGIN:** with James McLaughlin, Bangor, Maine.

**TREE:** vigorous; fairly productive; an early and an annual bearer; class *Domestica*.

**FRUIT:** size medium to large; form roundish oval, flattened at the ends; stem five-eighths of an inch long, in a small shallow cavity; apex small point in a slight depression; suture traceable; skin thin; color greenish yellow, mottled with red; bloom delicate whitish.

**FLESH:** semi-cling; pit small; color clear yellow; texture tender, very juicy; flavor rich, sweet and excellent.

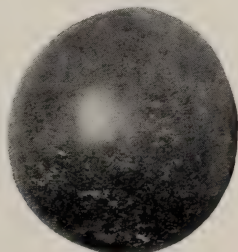
**QUALITY:** dessert very good to best; cooking good.

**VALUE:** market first class; rather tender for distant shipments.

**SEASON:** September.

#### MANKATO.

"Fruit above medium to large, roundish; cavity narrow, medium depth; suture a distinct line; apex rounded; color deep, dull red with a moderately heavy bloom; dots numerous, small, yellow; bloom rather heavy; skin thick, tough; flesh deep yellow, juicy, sweet, good flavor not astringent; stone large, flat, semi-cling; quality good. Season late August to early September. Better in quality than Bixby, but not as handsome. A good early plum. Promising." (*Macoun*).



MANKATO.



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MARU.

Productive and early, but too small and poor in quality to be recommended.

ORIGIN: imported by L. Burbank in 1885.

TREE: habit spreading; fairly vigorous; very productive.

FRUIT: size small; form roundish; cavity narrow, abrupt; stem short and stout; suture scarcely traceable; bright red, turning dark red; bloom thin.

FLESH: cling; color yellow; texture tender, juicy; flavor pleasant.

QUALITY: dessert fair; cooking fair.

VALUE: market second class.

SEASON: mid-August.

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## MILTON.

A seedling of Wild Goose; valuable for its hardiness.

ORIGIN: Iowa.

FRUIT: size medium; roundish oval, or oblong; color dark red, with numerous dots.

FLESH: texture melting, firm.

QUALITY: fair.

VALUE: market second class.

SEASON: a week earlier than Wild Goose.

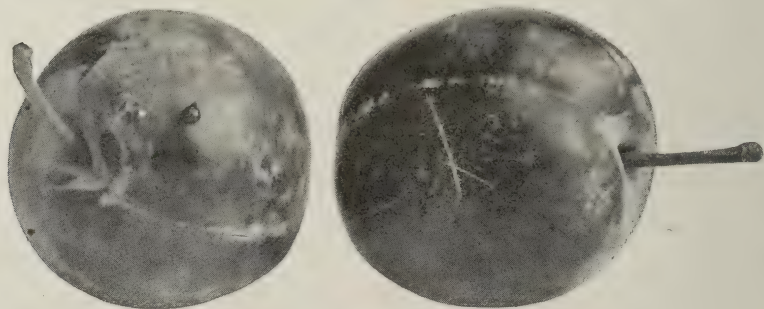
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## MONARCH.

A profitable commercial variety; a good shipper.

ORIGIN: England.

TREE: a vigorous grower; habit upright; an early, regular and abundant bearer; class Domestica.



MONARCH.

FRUIT: large; roundish ovate; color dark purple with heavy bluish bloom; stalk about seven-eighths of an inch long, stout, in a moderately deep cavity; suture broad, shallow.

FLESH: color yellow; texture firm; flavor sweet, slightly acid.

QUALITY: very good for all purposes.

VALUE: market first class.

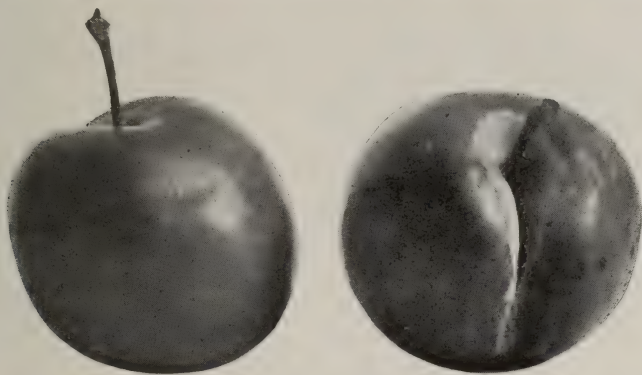
SEASON: late September.

## OGON.

Somewhat irregular in size, but its earliness, just following Red June and Willard, make it of value to the plum grower.

ORIGIN: imported from Japan by H. H. Berger & Co., of California.

TREE: class Japan; habit spreading; fairly vigorous; fairly productive.



## OGON.

FRUIT: form roundish, irregular; size medium; color yellow; bloom slight, whitish; stem half an inch long in a deep narrow cavity; suture deep or shallow, half round; apex blunt.

FLESH: free; color yellow; texture firm with a little juice; flavor flat.

QUALITY: poor for dessert; fair for cooking.

VALUE: market first class.

SEASON: mid August.

POND. (*Pond's Seedling*).

A beautiful and showy plum, but not much planted in the commercial orchard; somewhat subject to rot.

ORIGIN: England.

TREE: vigorous; moderately productive.

FRUIT: size very large; form obovate, tapering toward the base; skin thick, purple, with purplish bloom and numerous brown dots.

FLESH: color yellow; texture juicy; flavor pleasant.

QUALITY: very good.

VALUE: market first class only for its susceptibility to rot.

SEASON: mid September.

## PRUNE D'AGEN.

"Medium in size, obovate, somewhat necked; color reddish purple with heavy blue bloom and numerous small dots; stalk one inch long, curved, in small cavity. Flesh greenish yellow, rich, very good to best; nearly free from pit. Grown largely on the west coast for drying, but in States to the east and south to a less extent. Domestic." (*Budd*).

PURPLE EGG. (*Hudson River Purple Egg*).

A good commercial variety, especially for preserving.

ORIGIN: on the banks of the Hudson River, New York State, exact locality not known.

TREE: upright, vigorous grower, hardy and very productive.

FRUIT: size large; form ovate, often necked; color of skin, dark, rich red to purple; stem long in a deep cavity; suture shallow; bloom thin; clings to stone.

FLESH: color, greenish yellow; texture firm; flavor brisk acid.

QUALITY: dessert poor; cooking, very good.

SEASON: late September.

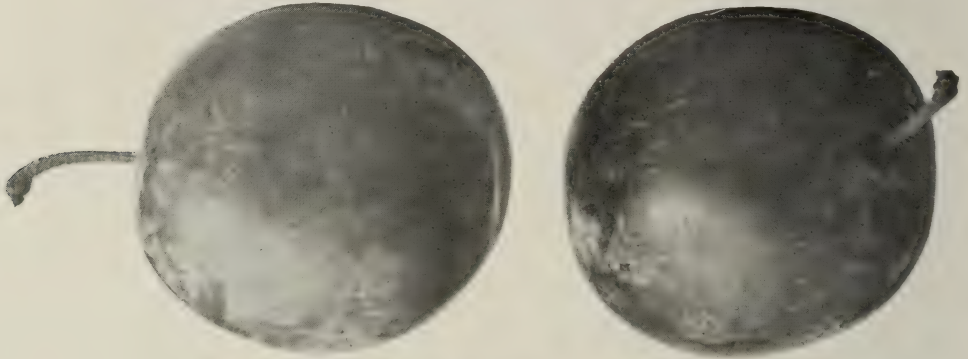


## QUACKENBOSS.

A good market plum; one of the best for distant shipment.

ORIGIN: at Albany, N. Y.; introduced by Mr. Quackenboss, of Greenbush, N. Y.

TREE: very vigorous; habit upright; hardy; fairly productive.



QUACKENBOSS.

FRUIT: large; form roundish oval; color dark purple, with blue bloom; stem of medium length set in a very slight cavity; suture traceable.

FLESH: semi-cling; color greenish; texture rather firm; flavor sprightly.

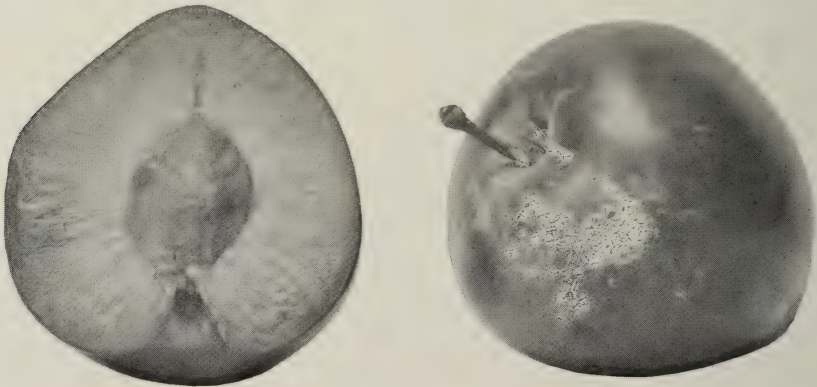
QUALITY: dessert fair; cooking good.

VALUE: market first class.

SEASON: late September.

RED JUNE. (*Red Nagate of Thomas*).

The earliest good plum grown, and one of the most profitable of the Japanese varieties.



RED JUNE.

ORIGIN: Japan; introduced to the public in 1893, by Stark Bros., Louisiana, Mo., who gave it the name of Red June. The Japanese name was "Shiro Smomo."

TREE: hardy and vigorous, forming a symmetrical top; an early and fairly abundant bearer; should be planted with such varieties as Burbank, Abundance or Chabot, to secure cross fertilization.

FRUIT: form, roundish conical; apex pointed; size, medium; suture distinct; skin thick, tenacious; color bright red, deepening to dark red when fully ripe, with light bluish bloom; stem one-half an inch long; cling.

FLESH: color yellow; texture somewhat juicy, moderately firm; flavor agreeable.

QUALITY: dessert good; cooking, very good; an excellent substitute for the Damson.

VALUE: market first class.

SEASON: late July to early August.

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REINE CLAUDE. (*Reine Claude de Bavay. Green Gage*).

The Reine Claude and several varieties of the Green Gage type are of especial value for culinary purposes. For pies, sauce or canning purposes, they seem to be growing in demand year after year, and no collection of plums for the home garden is, therefore, complete without a tree or more of this or some other variety of this family. With Ontario fruit growers, the most popular Gage is the Reine Claude de Bavay, commonly known among them as Reine Claude, which name is also an old synonym of the Green Gage. In the catalogue of the American Pomological Society it is called Bavay. The fruit of this later variety is in good demand among canners, and brings a fair price in our markets.

ORIGIN: this type of plum was brought from Italy to France about the year 1500 by Queen Claudia, wife of Francis I., after whom it was named Reine Claudia. Later, some trees were brought to England by a family named Gage, but the label on these trees being lost, the gardener called them Green Gage. Hogg, the English pomologist, however, tried to prove that this plum had been introduced into England before this time under the name of Reine Claude, and hence arose considerable confusion of names.



REINE CLAUDE.

TREE: productive; hardy, a slow grower.

FRUIT: roundish; size medium; skin greenish, yellowing towards maturity, with a thin whitish bloom and a few red dots; stem three-quarters of an inch long, set in a small, abrupt cavity; suture traceable.

FLESH: color pale green; texture melting and juicy; flavor rich, sweet and excellent; pit mostly free.

QUALITY: cooking or canning, best; dessert very good.

VALUE: home market first class.

SEASON: mid to late August.



SATSUMA. (*Blood*).

One of the most satisfactory of the Japan plums; commercially valuable in the Niagara district. Highly esteemed for canning, and for jelly.

ORIGIN: imported by Luther Burbank from Japan to America in 1886; called "Blood" from the blood red color of the flesh.

TREE: habit spreading; fairly vigorous; ordinarily very productive; self sterile, and should be planted with other varieties.



SATSUMA.

FRUIT: oblate, slightly conical; size large; stem about three-quarters of an inch in length, stout, set in a deep cavity; suture traceable; skin thick; color dark red, with whitish bloom and many dots.

FLESH: cling; color dark red; texture firm; flavor pleasant when well ripened; a little acid.

QUALITY: cooking very good.

VALUE: market first class.

SEASON: late September.

SHIPPERS PRIDE. (*Pride*).

An excellent market plum; a good shipper and fine for canning.

ORIGIN: New York State.

TREE: very vigorous; very hardy; very productive.

FRUIT: size large; form roundish oval; color dark purple.

FLESH: firm, juicy; flavor sweet.

QUALITY: dessert fair; cooking good; excellent for canning.

VALUE: market first class, being a fine shipper.

SEASON: early to mid September.



SHIPPERS PRIDE.

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SHROPSHIRE DAMSON.

A small plum, very highly valued for jam and for preserves; much sought after by those who know its value.

ORIGIN: Shropshire, England.

TREE: upright, fairly vigorous, quite productive.

FRUIT: small, oval; color dark purple, with blue bloom; stalk half an inch long, no cavity; suture none.

FLESH: nearly free from stone; texture melting, juicy; flavor rich, acid.

QUALITY: dessert fair; cooking very good to best.

VALUE: market first class

SEASON: late.

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SIMON. (*Prunus Simoni*, *Simonsi* of Thomas, *Simon's Plum*).

A distinct species of stone fruit, having characteristics of both the peach and the plum. It has been tested in Ontario since 1888, and has not realized the expectations of planters who were led to expect in this fruit a substitute for the peach where the latter fruit was uncertain. It has proven itself worthless in the commercial orchard, and valuable only as a curiosity.

ORIGIN: northeastern China, introduced to France by Eugene Simon and disseminated by Simon Bros. of Metz, Alsace. Fruited at Cornell University in 1886, and at St. Catharines, Ont., in 1887. It was placed in the plant distribution list by the Fruit Growers' Association in 1890.

TREE: upright, slender, lacking in vigor, not productive.

FRUIT: large; form round transversely and flattened longitudinally; color dark maroon, with a perceptible bloom; stalk half an inch long, stout, set in a deep cavity; suture distinct; stone smooth, clings tightly to the flesh.

FLESH: orange color; texture, tough and juicy; flavor often bitter, sometimes fairly agreeable.

QUALITY AND VALUE: very poor.

SEASON: early August.

ADAPTATION: to the peach sections.

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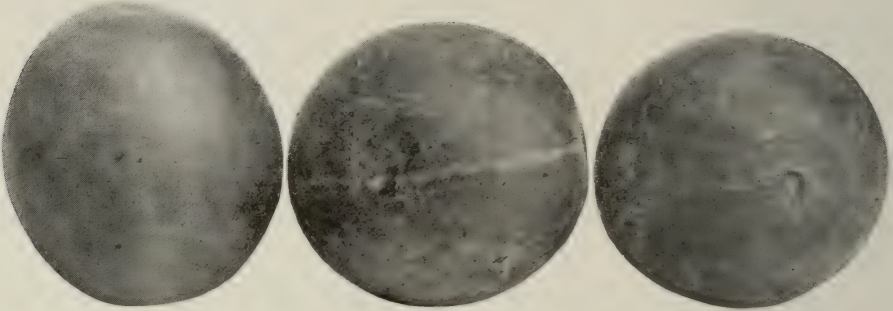
## SMITH ORLEANS.

"Fruit large to very large, oval, rather widest toward the stalk, a little irregular, with a strongly marked suture on the side; stalk quite small and slender, a little more than half an inch long, inserted in a deep narrow cavity; skin reddish purple; covered with a deep blue bloom; flesh deep yellow, a little firm, very juicy, with a brisk rich vinous flavor, and adheres to the stone; good to very good; late August, growth very vigorous." (*Downing*).



## STODDARD.

"Fruit large to very large; roundish; cavity narrow, shallow; suture a distinct line; apex rounded; color deep yellow, almost entirely covered with deep purplish red; dots fairly numerous, small yellow; bloom light, skin thick, tough, slightly astringent; flesh deep yellow, juicy; stone medium size, broad, flat, cling; sweet, good rich flavor; quality very good. Season late September. One of the largest and best flavored Americana plums." (*Macoun*).



STODDARD.

VICTORIA. (*Sharp; Sharp's Emperor*).

A fine dessert plum for the amateur's garden. It has been long known as Victoria, and indeed by no other name in Ontario.

ORIGIN: Sussex, England.

TREE: vigorous and productive.

FRUIT: size large, form oval; suture distinct; color of skin light reddish-purple; stem nearly one inch long in a moderately deep abrupt cavity; dots whitish and pinkish; clingstone.

FLESH: yellow; flavor pleasant.

SEASON: early in September.

QUALITY: very good.

ADAPTATION: considered a success at our Lake Huron station, in Bruce County.



VICTORIA.

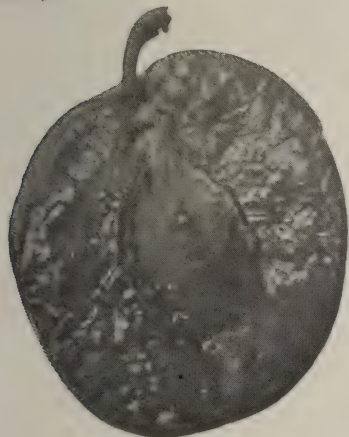
## WASHINGTON.

Not productive enough, nor good enough a shipper to be popular in the commercial plum orchard; but, on account of its large size, beauty and excellence of quality, a universal favorite for the dessert table.

**ORIGIN:** New York City, as a sucker from a grafted tree, which was purchased from a market woman by a Mr. Balmer. He first fruited it in 1818, and the plum was at first called Balmer after him.

**TREE:** a strong, vigorous grower; fairly productive; foliage remarkably large, broad and glossy.

**FRUIT:** size large; form round oval; suture traceable, very distinct near the stem; color dull yellow, changing to deep yellow, marked with crimson dots and covered with pale bluish, grey bloom; stem three-quarters of an inch long, set in a wide, shallow cavity.



WASHINGTON.

**FLESH:** yellow; texture firm; flavor rich, sweet and luscious.

**QUALITY:** dessert, very good; cooking, very good.

**VALUE:** home market, first class.

**SEASON:** late August.

#### WHITAKER.

The best of its class fruited at our St. Lawrence station.

**ORIGIN:** a seedling of Wild Goose; raised by J. T. Whitaker, Texas; closely resembling its parent.

**TREE:** vigorous; rapid grower; spreading habit; healthy; foliage bright green, free from shot hole fungus; late bloomer; class Chickasaw.

**FRUIT:** oval; size medium; cavity shallow; suture traceable; color bright red, with many white dots and thin bluish bloom; skin thin.

**FLESH:** color yellow; texture moderately firm, juicy; flavor sweet and good.

**QUALITY:** good.

**VALUE:** market second class.

**SEASON:** September.

#### WICKSON.

Among the largest and finest of the Japan plums, but not productive enough to be profitable as a market variety. Introduced with a great flourish and largely planted, but in most cases it has proven a disappointment.

**ORIGIN:** grown from seed of Kelsey by Luther Burbank, of Santa Rosa, Cal.; from its habit the tree appears to have some relation to *Prunus Simoni*.

**TREE:** habit very upright, bearing fruit mostly on fruit spurs; hardy; blooms early and abundantly, but sets very little fruit; should be planted with such productive sorts as Burbank for cross pollination; class Japanese.

**FRUIT:** form oblong conical, apex a point; size large to very large; skin thick; color yellow, mostly covered with rich brownish red; bloom thin; stem stout; cavity large, deep, abrupt; suture very decided from base to apex.

**FLESH:** semi-cling; color yellowish, translucent with yellow veins; texture firm for shipment, but tender and juicy when fully ripe; flavor sweet, rich, aromatic.

**QUALITY:** very good for all purposes.

**VALUE:** market first class.

**SEASON:** mid September.



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WILD GOOSE.

"Fruit oval; size medium to large; cavity shallow; stem medium long; suture a line; color bright, clear red; dots many, white, conspicuous; bloom thin, bright bluish; skin thin, but rather tough; stone small to medium, oval, pointed, cling; flavor sweet; quality fair to good; season early; origin Columbia, Tennessee." (*Waugh*).

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WILLARD.

A profitable market plum on account of the early season of ripening its fruit, but too poor in quality to receive much commendation, and not very productive. ,

ORIGIN: Japan.

TREE: vigorous; rather spreading in habit; fairly productive.

FRUIT: size medium, sometimes above; form roundish oblong; color greenish, partly overspread with dull red; suture clearly traceable; apex elevated not pointed; bloom thin, whitish.

FLESH: yellowish; moderately firm; not very juicy; semi-cling; flavor poor.

QUALITY: dessert poor; cooking fair.

VALUE: first class in its season for market.

SEASON: early August.

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WOLF.

"Fruit large, roundish; cavity narrow, shallow; suture shallow, fairly distinct, not depressed; apex rounded; color deep red; dots fairly numerous, small, yellow, distinct;



WOLF.

bloom moderate; skin thick, tough; flesh deep yellow, juicy, sweet, rich, good flavor; stone above medium size, outline oval, considerably flattened, cling; quality good; season early to mid September. One of the best." (*Macoun*).

## WYANT.

"Fruit large, oblong, flattened; cavity narrow, deep; suture a distinct line; apex almost pointed; color deep red; dots numerous, small, purple; bloom medium; skin rather thick, somewhat tough, astringent; flesh deep yellow, moderately juicy, fairly sweet; stone large, much flattened, oval, semi-cling, almost free; quality medium. Season mid September. Quality not good enough. This plum is highly recommended in the Western States, but has not proven so good as some others here. (Ottawa)." (*Macoun*).

YELLOW EGG. (*White Magnum Bonum*).

A profitable commercial variety, on account of its large size and fine appearance, but susceptible to the plum rot and inclined to drop before maturity. Good for canning purposes.

ORIGIN: Europe.

TREE: vigorous, spreading, and very productive.



YELLOW EGG.

FRUIT: size large to very large; form egg shaped with distinct suture on one side; skin thick, adherent to flesh; color yellow with whitish bloom; stalk nearly an inch long, inserted in a small cavity, with a fold about its base; pit long, pointed, cling.

FLESH: yellow; texture firm, juicy, coarse; flavor subacid, becoming sweet when very ripe, but ordinary.

QUALITY: dessert poor; cooking good.

VALUE: home market first class.

SEASON: late August.



## THE QUINCE.

As there is only a limited demand for quinces in Canada, this fruit is not largely grown. It is somewhat tender, but can be grown commercially wherever the peach succeeds. Some quinces are, however, produced for home consumption as far east as the Bay of Quinte.

The culture of the quince is somewhat similar to that of dwarf pears. The soil most suitable is a friable clay loam, well drained. Three year old trees are planted from fourteen to fifteen feet apart each way. The trees are pruned with a somewhat open top as the dwarf pear, the head starting from near the ground. If the trees make rapid growth severe heading in should be practised to get stockier trees and to have the fruit better distributed. Good cultivation is necessary in the production of the quince as with other fruits.

The quince makes a handsome ornamental tree where it can be grown, the abundant white bloom in the spring and the golden fruit in the autumn rendering it a striking object wherever planted.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

Fuller, Orange (the leading market variety in Ontario), Champion (for Southern Ontario only as it ripens too late for other sections).

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## DESCRIPTION OF VARIETIES.

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### BENTLEY.

A variety grown largely for market in Maryland, and in Ontario it is gaining in favor.

TREE: thrifty; productive.

FRUIT: large; form roundish; skin yellow with heavy down.

QUALITY: excellent.

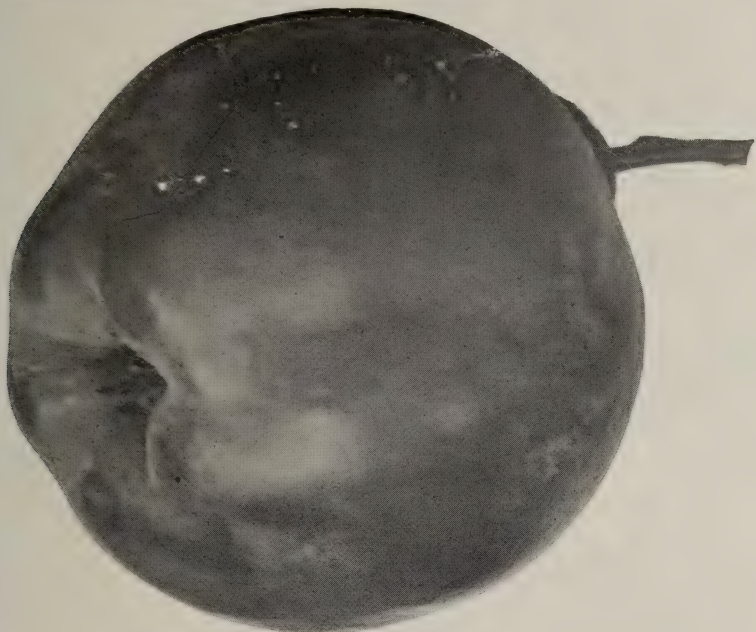
VALUE: market first class.

SEASON: early October.

## CHAMPION.

An American quince of recent origin.

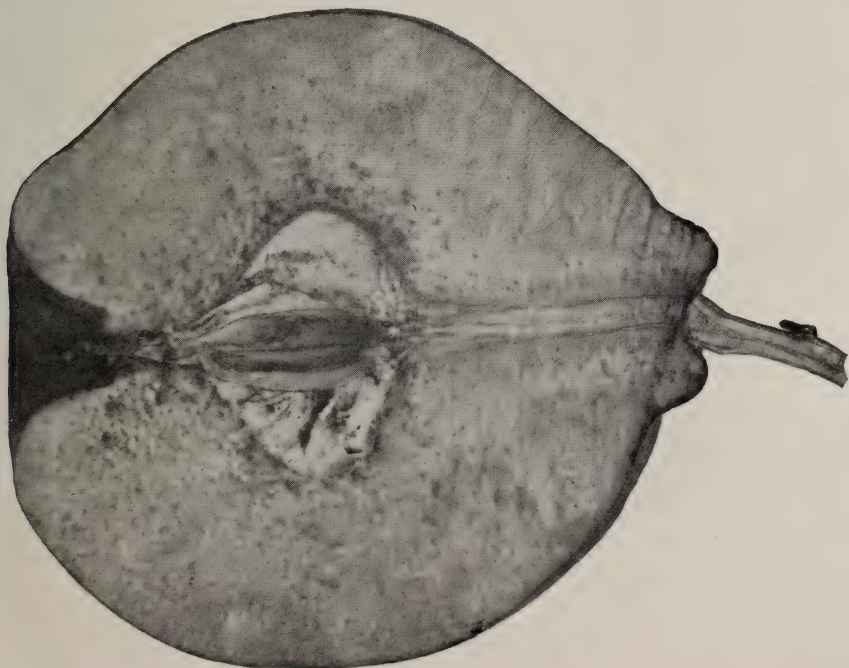
TREE: an upright grower, taller than the Orange.



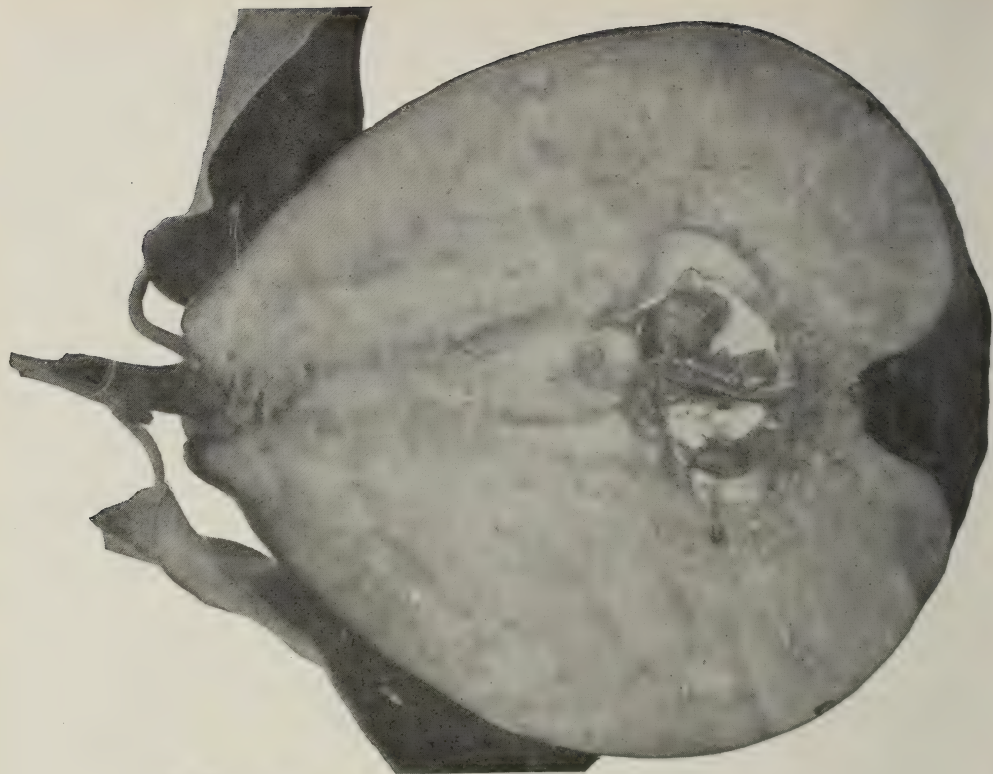
FRUIT: large, distinctly pear-form, furrowed about the top, generally remaining greenish yellow upon the tree; conspicuously covered with a floccose wool or fuzz.

SEASON: mid winter.

ADAPTATION: ripens well in Southern Ontario, but would be too late farther north.







FULLER



## FULLER.

ORIGIN: named after Mr. A. S. Fuller, of Ridgewood, N. J., who noticed it fruiting on a neighbor's grounds in about the year 1870, took some cuttings and introduced it to public notice.

TREE: a good grower and showy both in fruit and flower.

FRUIT: large; distinctly pyriform in shape, sometimes with an elongated neck, somewhat ribbed; color rich yellow; calyx set in a deep wide basin.

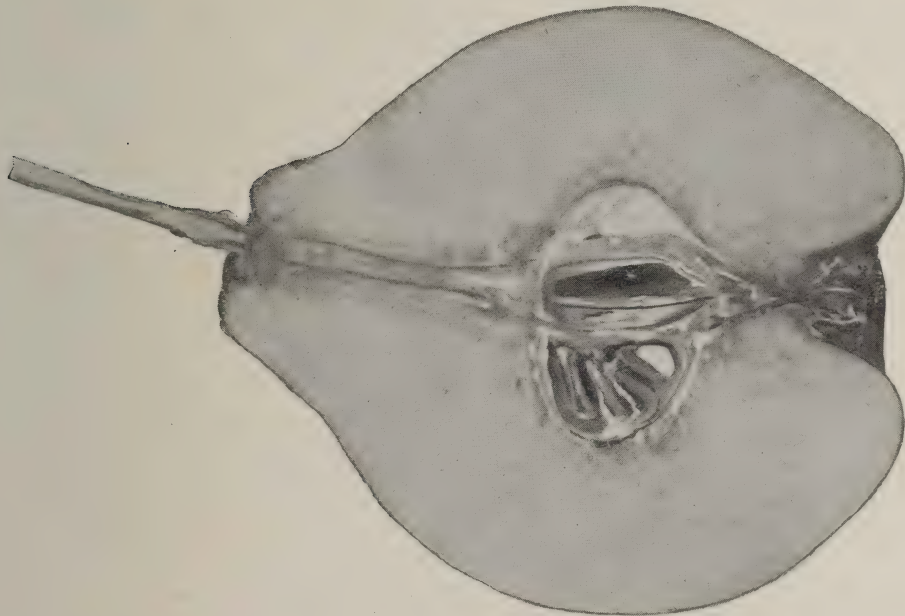
FLESH: tender in texture; flavor good.

VALUE: market first class.

SEASON: late September.

## ORANGE. (Apple).

The leading market variety of quince in Canada. Previous to 1870, this and the Angers were the only varieties of quinces known in Ontario, the former as a stock for budding dwarf pears, and the latter as a standard market variety. The Orange quince succeeds admirably in the Niagara peninsula, ripening well, taking on a beautiful rich golden color, and reaching a fine large size, either on clay or sandy loam. In old days this variety brought \$6 or \$7 per barrel in Toronto market, but the prices are now much lower.



ORIGIN: Southern Europe.

TREE: a slow grower, bushy, seldom attaining a height of more than twelve or fifteen feet; hardy, will endure neglect but responds well to good cultivation and manure; delights in moist land, without standing water; fairly productive.

FRUIT: large and weighing from eight ounces to a pound; form somewhat like an apple, but with protuberance about the stem instead of a depression; skin golden yellow at maturity, with often a little greenish or russet color about the stem, which is set in a narrow cavity; calyx large segment, which are leaf like, in a large deep, corrugated basin.

FLESH: tender in texture and good in flavor.

VALUE: limited demand in Canadian markets.

SEASON: late September to early October.



## THE GRAPE.

There is no more popular fruit than the grape, and, owing to the rapid increase in population during recent years, the demand for grapes is constantly growing. For this reason the planting of grapes, which was in a large measure suspended for a few years, is steadily increasing, many vineyards now being established annually.

The grape requires a comparatively dry hot season for the development of good flavor and the perfect ripening of the fruit, and as most of the cultivated varieties will not stand very low temperatures unless protected, the grape succeeds best in the most southern parts of the Province, the commercial vineyards being confined almost entirely to the Niagara Peninsula, and to the district bordering Lake Erie. The grape can, however, be grown successfully over a much wider area than this, and where the summer temperature is fairly high and spring and early autumn frosts are rare, large quantities of grapes are grown for home consumption. Hence the early varieties of this fruit may be ripened pretty generally over the Province as far north as latitude 45 degrees and probably further.

A southern or south-eastern slope, if it can be procured, is preferable for the grape, as this fruit will ripen quicker with this exposure, but the site is not so important in the best grape districts as it is further north. A site should, however, be chosen which will not be subject to local frosts. In the north a sandy loam is much to be preferred, as if well drained it will be the warmest, and all the heat that can be obtained is needed. In the warmer portions of the Province grapes succeed admirably on the clay loams, and if well drained these are considered the best. The soil should be thoroughly prepared as for other fruits. The best vines for planting are two years old, but some strong growing varieties make good plants in one year. Strong growing varieties require more space in a vineyard than those less vigorous, but an average distance of ten feet apart each way is perhaps the most satisfactory. The plants should be set a little deeper than they were in the nursery. With grapes it is better to err on the side of deep than shallow planting. The young vine should be cut back to within one or two buds when set. To encourage strong growth, cultivation should be thorough in the vineyard until the vine begins to bear well. At the close of the first season and before the growth begins the following spring, the vine should be again pruned back to one or two strong buds. During the second season, only two canes are permitted to grow in order that these may become as strong as possible. Before growth begins in the third year it will be necessary to put down the trellis. If the Kniffen system is adopted two wires will be sufficient, but if other methods are followed, three are usually necessary. The Kniffen system of training is more general in the grape districts than any other, mainly for the reason that by this method the least labor is involved. If two canes were left during the second season's growth, the weaker is removed, the other is tied upright to the two wires, the lower one being about 3 feet 6 inches from the ground, and the upper about 2 feet higher. Shoots will be thrown out along this main trunk, all of which are allowed to grow throughout the season.

Before growth begins in the spring of the fourth season all the canes are cut away except four. Two of these are extended one on each side of the main trunk along the upper wire and tied to it, and two on each side of the main trunk along the lower wire, at the same time heading back the upper canes to eight or nine buds and the lower to six or seven. No summer pruning is usually practised

with this system, the growing shoots falling over the wires and attaching themselves there, often making very rampant growth, so much so that the tips are sometimes lopped off with a pruning hook.

The vine should bear a full crop this season, which is the fourth from planting. Before growth starts in the fifth season all canes are again removed except four, and as these could not very well be obtained in line with the wires if taken from the main trunk, the canes are utilized which spring from the base of the canes which were left the year before. This same system is adopted year after year. In time such a large stub develops at the point where the new canes are taken each year that it becomes necessary to remove these and take new canes from the main trunk. A good supply of new wood is required each year in grape growing, as fruit is produced only near the base of the previous season's growth. About forty strong buds or even less are sufficient to give a profitable crop of most varieties.

For the north quite a different system is necessary, as the vines have to be covered with soil in the winter to protect them. On this account the arms have to be trained low so that they may be covered easily. The best system which has been found where such conditions prevail in Ontario, is a modification of the "High Renewal." By the "High Renewal" system new wood is obtained from near the ground every year and several canes trained in a somewhat fan shape. This system is adopted in some parts of New York State, where vines do not have to be covered. By a modification of this system two arms are left for two or three years. Three wires are required, the lowest being about eighteen inches from the ground, and the others about two feet apart. The two canes which have been made during the second season's growth, as previously described, are both saved. They should start from the main stem as near the ground as possible, and are tied to the wire in opposite directions. The shoots which are made the third season are tied upright to the wires and spread as evenly as possible. Lateral shoots should be removed. Before winter all the canes made that season should be headed back to within one or two buds of the two main arms, and just before winter sets in they should be bent down and covered with a few inches of soil. In fact, the vine should be covered each winter from the time it is set. Vines should be kept covered in the north as long as possible to prevent injury from spring frosts. At Ottawa, the vines are not uncovered until the end of the first week or beginning of the second week of May.

In the fourth season after planting the shoots are again trained upright and tied to the wires. Laterals are removed and any other shoots which make the vine so crowded that the fruit will not obtain plenty of light and sunshine. The mistake is often made of leaving too many shoots to grow, thus preventing the perfect ripening of the fruit. Forty strong shoots are quite sufficient to produce a good crop of fruit, although some varieties will stand a few more.

As arms get older they become more difficult to lay down, hence it is found advisable to remove the arms every two or three years and replace them with new ones. The arms may be renewed in alternate years, and this is often desirable, as the buds on one arm are sometimes destroyed by winter or by spring frosts. The only important difference between this system and the horizontal arm is that in this the arms are not permanent. It resembles the "High Renewal" from the fact that new wood is obtained frequently from the main stem near the ground.

Grapes require considerable potash, hence fertilizers containing a high percentage of this should be used rather than nitrogenous manures. Cover crops will usually supply all the nitrogen that is required.

Grapes should not be picked until they are quite ripe, as they do not ripen after they leave the vine. It is believed that the consumption of grapes would



be much greater in the cities and towns if fruit growers would not pick and ship the fruit when it is green.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

##### *Commercial and Domestic:*

*Black:* Moore, Campbell, Worden, Concord, Wilder.

*Red:* Delaware, Lindley, Agawam, Vergennes.

*White:* Niagara, Diamond.

##### *For Northern Sections:*

*Black:* Champion, Moore, Campbell, Worden, Wilder.

*Red:* Moyer, Brighton, Delaware, Lindley.

*White:* Winchell, Diamond.

#### DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Wentworth District:* By M. Pettit, Winona, Ont.

##### *Commercial:*

*Black:* Champion, Campbell, Worden, Concord.

*Red:* Delaware, Lindley, Agawam, Vergennes, Catawba.

*White:* Niagara, Diamond.

*Niagara District:* By Linus Woolverton, Grimsby, Ont.

*Domestic:* Moyer, Campbell, Worden, Delaware, Lindley, Brighton, Wilder, Agawam, Requa.

## DESCRIPTION OF VARIETIES.

### ALICE.

A good grape but a little late to be very popular for market purposes.

ORIGIN: New York State.

VINE: very vigorous; productive.

BUNCH: roundish; shouldered; compact.

BERRY: size small to medium; round; color dark wine with light bloom.

FLESH: tender pulp, juicy; color light green; flavor vinous, aromatic, pleasant.

QUALITY: dessert good.

VALUE: second class for market.

SEASON: early October.

### BACCHUS.

A good wine grape.

ORIGIN: seedling of Clinton, raised by J. H. Ricketts, Newburgh, N. Y.

VINE: vigorous; free from mildew; productive.

BUNCH: size medium; compact; shouldered.

BERRY: size small; round; black with blue bloom.

FLESH: texture juicy; flavor sprightly, superior to Clinton.

QUALITY: dessert fair.

VALUE: second rate for market.

SEASON: late; cannot be depended upon to ripen north of lake Ontario.

AGAWAM. (*Rogers' 15*).

One of the leading varieties for profit, but in some sections subject to mildew and rot.

ORIGIN: by E. S. Rogers, Salem, Mass.

VINE: a strong grower; very productive; self fertile; wood long jointed, stout, should have long pruning.

BUNCH: large, compact, shouldered.

BERRY: large; skin thick; color brownish red.

FLESH: tender; flavor sweet, sprightly, very good.

QUALITY: dessert very good.

VALUE: Market, first class.

SEASON: soon after that of Concord.



AGAWAM.

BARRY. (*Rogers' 43*).

An excellent exhibition grape; one of the most attractive of Rogers' hybrids; but not equal to Wilder for the commercial vineyard.

ORIGIN: a hybrid from Black Hamburg and Mammoth Sage, raised by E. S. Rogers, of Salem, Massachusetts.

VINE: vigorous; healthy; productive; self sterile and needs mixed planting; sometimes drops its leaves before maturity of the fruit.

BUNCH: medium; form short, compact, rather broad.

BERRY: large; roundish; color black with blue bloom.

FLESH: tender; flavor sweet, pleasant.

QUALITY: dessert good

VALUE: market first class; a good shipper.

SEASON: mid September to October.



## BRIGHTON.

The fine size of its bunches and the excellence of its flavor as a dessert grape gave promise, in its first introduction, that the Brighton would be a popular commercial grape in Ontario; but in this we have been disappointed, because of its susceptibility to mildew, and its poor shipping quality. The latter point is of importance to our Ontario fruit growers, who look forward to the great Northwest as one of the best

markets for the product of their vineyards. As a dessert grape the Brighton is worthy of a place in every fruit garden which is planted for home uses.

ORIGIN: raised by Jacob Moore, Brighton, N.Y.; a cross between Concord (Labr) and Diana Hamburg (Vinifera).

VINE: vigorous; semi-hardy; productive; somewhat subject to mildew; leaves large, thick, dark green; pollen sometimes defective, and the vine should have other varieties which are good pollenizers planted near it.

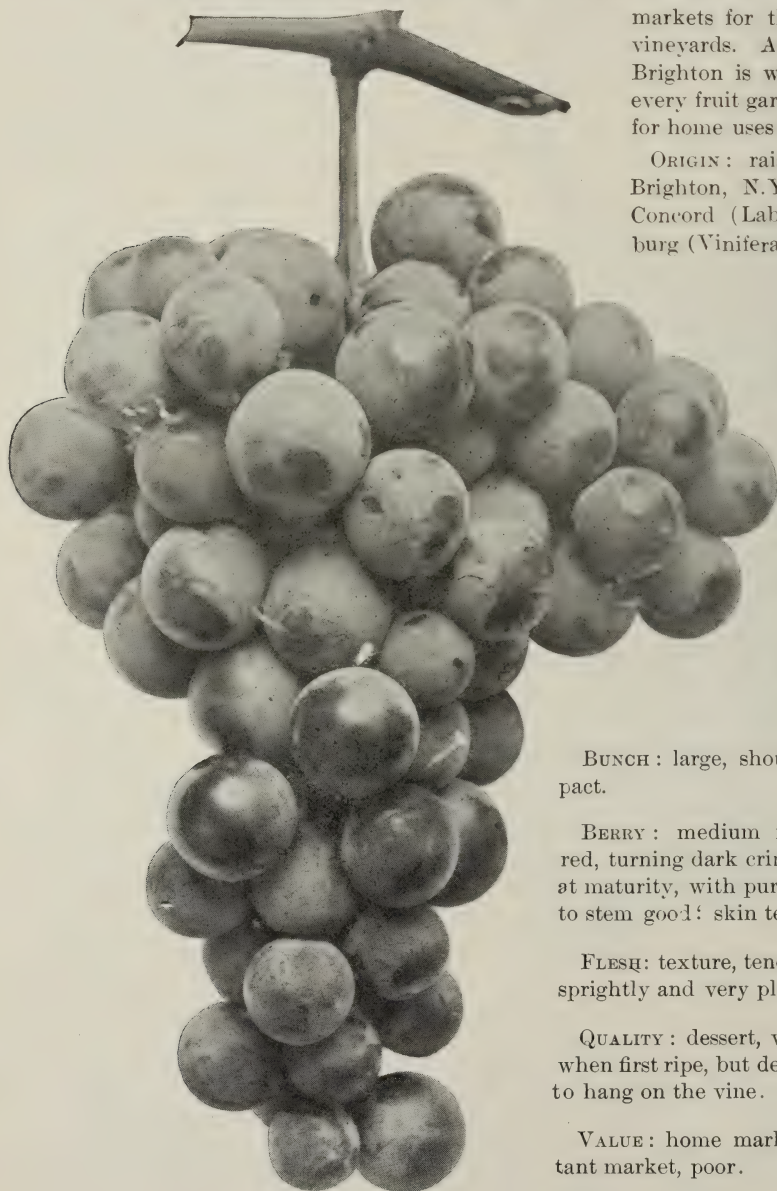
BUNCH: large, shouldered, fairly compact.

BERRY: medium in size; color light red, turning dark crimson or almost black at maturity, with purple bloom; tenacity to stem good; skin tender.

FLESH: texture, tender and juicy; flavor sprightly and very pleasant.

QUALITY: dessert, very good, at its best when first ripe, but deteriorates if allowed to hang on the vine.

VALUE: home market, very good; distant market, poor.



BRIGHTON.

SEASON: medium; not a long keeper.

## CATAWBA.

One of the best of wine grapes, and highly esteemed for dessert.

ORIGIN: a native of North Carolina, and takes its name from the Catawba river.

VINE: vigorous; productive; succeeds well in sandy loam; canes long, with few laterals.

BUNCH: medium sized; moderately compact; shouldered.



CATAWBA.

BERRY: large; round; deep red with lilac bloom; skin moderately thick.

FLESH: texture pulpy, juicy; flavor sweet, aromatic, musky.

QUALITY: dessert very good; wine best.

VALUE: market first class when well ripened.

SEASON: late; does not always attain full maturity even in the southern parts of the Province.



**CAMPBELL.**

*(Campbell's Early.)*

This grape is claimed to be an improved Concord, and is very promising as an early market variety.

**ORIGIN:** Ohio, by G. H. Campbell; the product of different crosses from Hartford, Concord, and Moore's Early, through Muscat Hamburg. Introduced in 1896.

**VINE:** vigorous, healthy and productive.

**BUNCH:** large shouldered.

**BERRY:** large; skin black, with thin blue bloom, tough; flavor rich and sweet without foxiness; flesh meaty, sweet, tender; seeds small, separate easily from the pulp; hangs well to vine.

**QUALITY:** fine for dessert.

**VALUE:** first-class for market.

**SEASON:** about the same as that of Moore Early.



**CAMPBELL.**

## CHAMPION.

Widely planted for market because of its early coloring and apparent early ripening, but so sour and so poor in quality, as usually sold on the market, that it has seriously lessened the demand for Concord grapes, which follow it in season.

ORIGIN: New York State, about 1873; first sold as Talman's Seedling.

VINE: vigorous; healthy, not subject to mildew; very productive.

BUNCH: size medium; shouldered.



CHAMPION.

BERRY: size medium; form round; color bluish black; pulpy; acid until very ripe; skin thick.

QUALITY: dessert very poor.

VALUE: Market fair, sells well on its outside appearance before better flavored kinds are on the market.

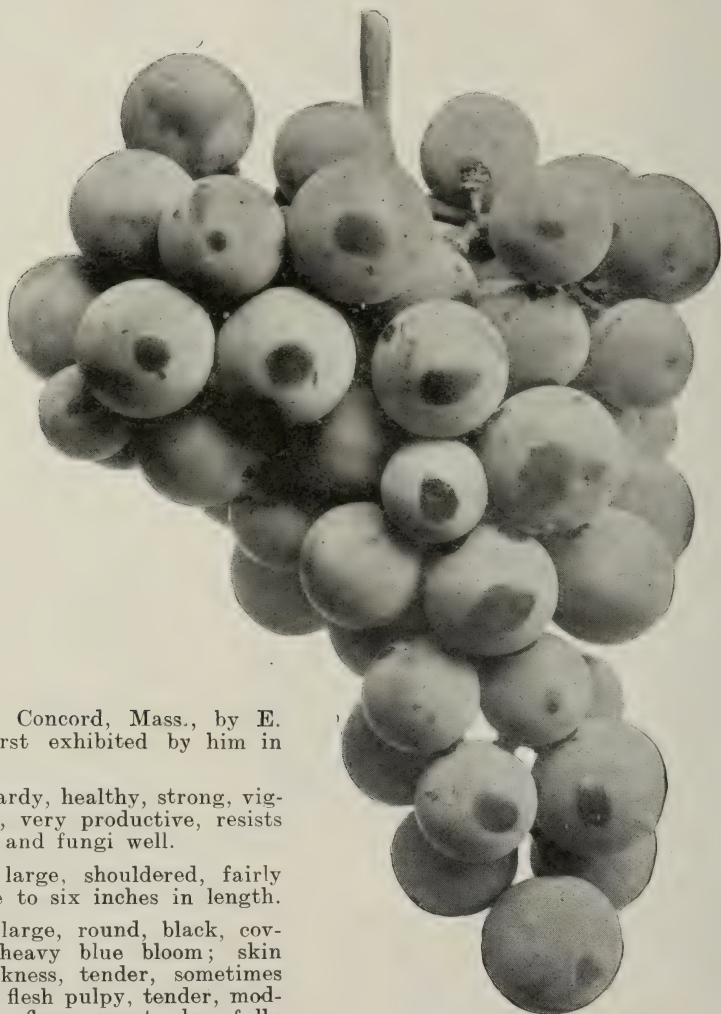
SEASON: a week or ten days earlier than the Concord, but often well colored two weeks earlier.



## CONCORD.

The principal out-door grape grown for market in the Province of Ontario. Probably more than half the vines in the large commercial vineyards of the Niagara district, as well as in Essex and other parts of southern Ontario are of this variety.

The reason of this is (1) its comparative freedom from mildew, (2) its vigor of vine, (3) its productiveness. Four tons to the acre is not an uncommon yield, so that, even when it sells as low as  $1\frac{1}{2}$  cents per pound, there is yet a fair return for the investment.



**ORIGIN:** Concord, Mass., by E. W. Bull; first exhibited by him in 1853.

**VINE:** hardy, healthy, strong, vigorous grower, very productive, resists both insects and fungi well.

**BUNCH:** large, shouldered, fairly compact, five to six inches in length.

**BERRY:** large, round, black, covered with heavy blue bloom; skin medium thickness, tender, sometimes cracks open; flesh pulpy, tender, moderately juicy; flavor sweet when fully mature, appetizing.

CONCORD.

**QUALITY:** dessert fair.

**VALUE:** near market, first class; distant market, second class.

**SEASON:** mid September to October; not a good keeper.

**ADAPTATION:** general in grape districts.

## DELAWARE.

Universally acknowledged to stand at the head of all American grapes in point of quality. For the home garden a few vines of this variety are indispensable, for it is the most excellent of dessert varieties. It is also one of the highest priced grapes in our markets, often bringing more than double the price of the Concord. It is however, not very much grown in our commercial vineyards, because the foliage is badly subject to thrip and the yield is only moderate. On rich deep soils, well drained, however, with high cultivation, thinning and close pruning, it is productive and profitable. It should be planted much closer than the Concord. Vines of the latter variety are usually planted ten feet apart, while the Delaware may be set five or six feet apart.

**ORIGIN:** unknown. Name from Delaware, Ohio, where in 1855 it was first brought into notice, though not disseminated until ten years later. It was first found in a garden in Frenchtown, N. J. The Bushberg Catalogue thinks it a natural cross between Labrusca and Vinifera, a native American and a European variety.

**VINE:** moderate grower; foliage delicate, subject to thrip; wood slender, hardy; a regular, sometimes an abundant bearer.

**BUNCH:** small, compact, usually shouldered.

**BERRY:** small; round; skin thin; color a beautiful light red, with whitish bloom, translucent; pulp, sweet, sprightly, aromatic; juice abundant, sweet, vinous.



DELAWARE.

**QUALITY:** dessert good.

**VALUE:** market first class.

**SEASON:** September

**ADAPTATION:** general throughout the grape sections.

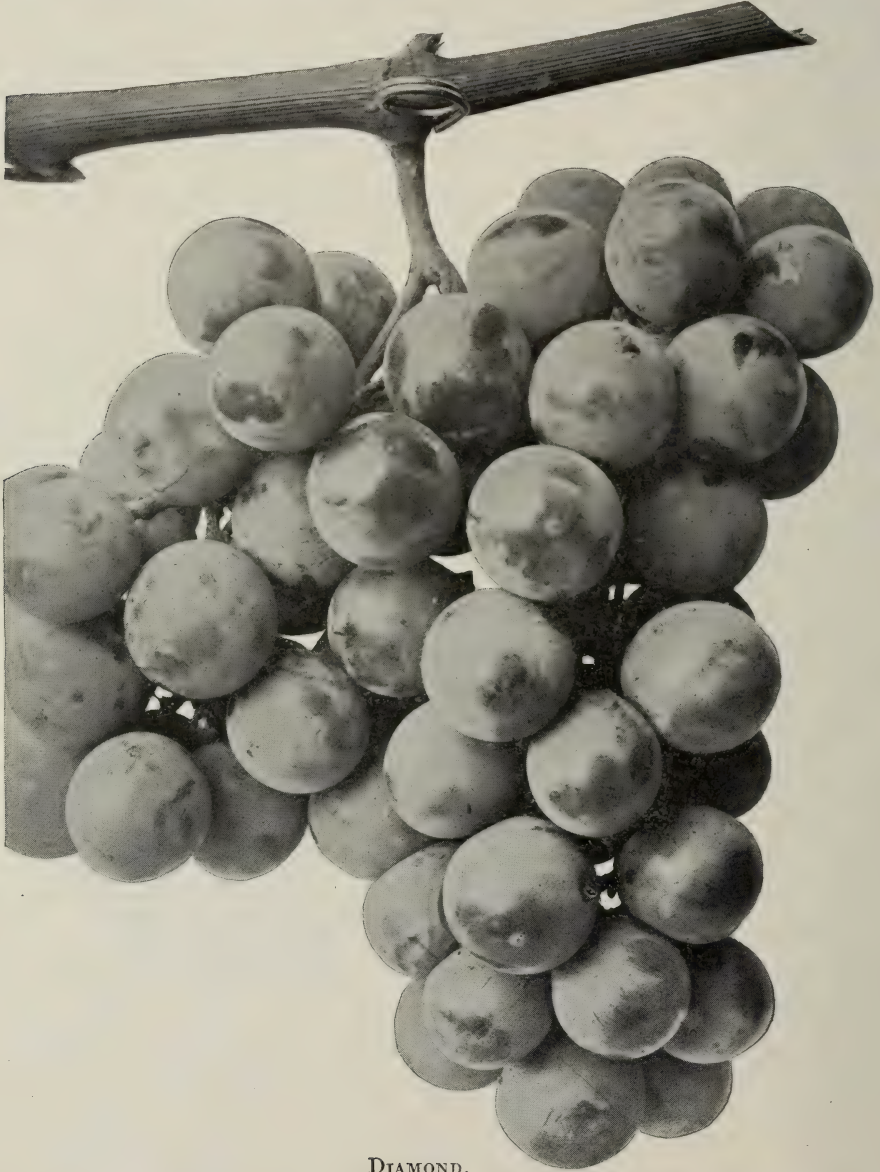


DIAMOND. (*Moore's Diamond*).

A grape that is growing in popularity, and which succeeds in sections farther north than the Niagara.

ORIGIN: Brighton, N. Y., in 1873, by Mr. Jacob Moore, from seed of Concord, fertilized with Iona; just one year after the Niagara was originated at Lockport.

VINE: vigorous and productive, though not equalling the Niagara; foliage much like that of one of its parents, the Concord.



DIAMOND.

BUNCH: large, compact and shouldered.

BERRY: adheres firmly to the stem; color greenish white, yellowing slightly at maturity; pulp tender; flavor juicy, sweet and good.

QUALITY: dessert very good.

SEASON: about one week in advance of the Concord.

ADAPTATION: worthy of trial generally.

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EARLY OHIO.

An early market grape.

ORIGIN: a chance seedling raised by R. A. Hunt, Euclid, Ohio.

VINE: healthy; vigorous; productive.

BUNCH: large, compact, often shouldered.

BERRY: medium size; color black, with heavy bloom; tenacious of stem; flavor spicy, pleasant.

SEASON: a few days in advance of Moore Early.

ADAPTATION: not proven.

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## EARLY VICTOR.

The Early Victor grape colors very early, fully two weeks ahead of Concord, and is fit to gather about ten days before, along with Hartford and Moore Early.

ORIGIN: by John Burr, of Leavenworth, Kansas, in 1870. A seedling of the Delaware.

VINE: very vigorous, very productive and healthy.

BUNCH: shouldered and very compact.

BERRY: medium, round, black, with thick blue bloom, adheres well; pulp tender, juicy, sweet and agreeable; seeds two.

QUALITY: very good for dessert, also very good for making claret wine.

VALUE: first class for home market.

SEASON: early.

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EMPIRE. (*Empire State*).

A beautiful white grape, with well formed bunches, which was introduced with great eclat, but has not become very popular in the commercial vineyards of Ontario.

ORIGIN: from seed of Hartford fertilized with Clinton, raised by James H. Ricketts.

VINE: vigorous, healthy, and moderately productive.

BUNCH: size large; shouldered; compact.

BERRY: medium; color white, with thick bloom; pulp tender, juicy, sweet, and agreeable.

QUALITY: dessert, very good.

VALUE: market first class.

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GAERTNER. (*Rogers' 14*).

An excellent grape which is gaining in favor.

ORIGIN: hybrid between White Chasselas and a wild Labrusca.

VINE: healthy; fairly vigorous and productive.

BUNCH: medium in size; shouldered.

BERRY: size large; round; color light reddish brown; skin thin.

FLESH: texture moderately tender; flavor sweet, rich, aromatic.

QUALITY: dessert very good.

SEASON: about with Concord.



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HARTFORD. (*Hartford Prolific*).

An old variety ripening in advance of Concord, but not popular as a market grape, because it drops its fruit so soon after maturity.

ORIGIN: Raised at Hartford, Connecticut, from seed of Isabella, about 1850.

VINE: hardy; vigorous; very productive.

BUNCH: large; shouldered; rather compact.

BERRY: size medium; round; color black with thin blue bloom; skin thick.

FLESH: whitish; texture pulpy, juicy; flavor foxy.

QUALITY: dessert poor.

VALUE: market second class, because of the fruit dropping from the stems; soon shrivels.

SEASON: a week before Concord.

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## JANESVILLE.

Valuable only in the colder sections.

ORIGIN: Hartford x Clinton.

VINE: hardy; vigorous; productive.

BUNCH: medium; short; compact; shouldered.

BERRY: size medium; black; skin thick; slight blue bloom.

FLESH: pulpy; color greenish; flavor vinous.

QUALITY: dessert poor.

VALUE: market second class.

SEASON: early.

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## JESSICA.

An excellent dessert grape for the amateur's garden.

ORIGIN: Canada; a seedling raised by W. H. Read of Port Dalhousie, introduced by Mr. D. W. Beadle of St. Catharines, and first described in the *Canadian Horticulturist* for February, 1884.

VINE: fairly vigorous, hardy and healthy.

BUNCH: shouldered, compact.

BERRY: medium; color yellowish green to white; skin thin; pulp tender, juicy; flavor sprightly, aromatic, sweet and very agreeable, free from foxiness.

QUALITY: very good for dessert.

VALUE: market too small; home uses very good.

SEASON: early.

ADAPTATION: general.

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## LADY.

A fine early sweet grape for the home garden; not desirable for the commercial vineyard.

ORIGIN: a pure Concord seedling, introduced by G. W. Campbell, of Ohio, in 1874.

VINE: fairly vigorous, slender; healthy; fairly productive.

BUNCH: medium in size; oblong; slightly shouldered.

BERRY: medium to large; round; greenish yellow with white thin bloom

FLESH: pulp tender, juicy; flavor vinous, sweet, slightly aromatic.

QUALITY: dessert good.

VALUE: market second class.

SEASON: early to medium

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LINDLEY. (*Rogers' 9*).

A favorite red grape for both domestic and commercial purposes. Of late, however, the vine has been somewhat disappointing in productiveness.



LINDLEY.

ORIGIN: Massachusetts, by E. S. Rogers; hybrid between Wild Mammoth grape of United States and Golden Chasselas.

VINE: vigorous; healthy, fairly productive.

BUNCH: medium in size; rather long; shouldered; loose.

BERRY: medium to large; color almost brick red.

FLESH: tender, separating freely from seeds; flavor sweet, rich, aromatic.

QUALITY: very good for domestic or commercial purposes.

VALUE: market first class.

SEASON: a few days in advance of Concord. Keeps easily until January.

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MASSASOIT. (*Rogers' 3*).

Commended for the home garden as a fine red table grape. Needs careful spraying with Bordeaux to prevent black rot.

ORIGIN: seedling raised by E. S. Rogers, Salem, Mass.

VINE: vigorous; susceptible to attacks of black rot; self sterile.

BUNCH: medium size; shouldered; loose, fruit does not always set.

BERRY: size medium; form round; color brownish red.

FLESH: texture tender, juicy; flavor sweet, vinous.

QUALITY: dessert very good.

VALUE: not profitable for market.

SEASON: just in advance of Concord.



MERRIMAC. (*Rogers' 19*).

Considered by some the finest and most reliable black Rogers grape; in Ontario the Wilder is considered more profitable, having larger bunches.

ORIGIN: Mammoth Sage x Black Hamburg; raised by Mr. E. S. Rogers, of Salem, Massachusetts.

VINE: vigorous; healthy; self sterile and needs mixed planting.

BUNCH: medium in size; fairly compact; roundish.

BERRY: size large; color black with blue bloom.

FLESH: color greenish; texture half tender, juicy; flavor sweet, vinous.

QUALITY: dessert very good.

VALUE: market first class.

SEASON: early to medium.



MOYER.

## MOYER.

For the amateur's garden this is a grape that should not be overlooked, for as a dessert grape it has now been fairly well tested, and seems to be growing in favor.

ORIGIN: Port Dalhousie, Ontario, by W. N. Read, from Delaware fertilized with Miller's Burgundy, about 1880.

VINE: fairly vigorous, healthy and not subject to mildew, hardy; not very productive.

BUNCH: small, cylindrical in form, shouldered, not very compact, not uniform in size.

BERRY: small, round; color amber with grayish bloom; skin thin, tough; pulp tender, juicy; flavor rich, sweet and excellent.

QUALITY: dessert very good, but inferior to Delaware.

VALUE: second class for market.

SEASON: very early.

MOORE. (*Moore's Early*).

A favorite with vineyardists in Ontario, because of its earliness and its good quality. As early as Champion and of very much better quality, it is superseding that variety which has done so much to prejudice buyers against our black grapes.

ORIGIN: by John B. Moore, at Concord, Mass., from Concord seed, in the year 1872.

VINE: hardy, healthy, fairly vigorous, but only moderately productive, if compared with the Concord; needs good cultivation.



MOORE.

BUNCH: smaller than Concord, and rarely shouldered.

BERRY: averaging a little larger than the Concord; round; black; thin bloom.

FLESH: vinous, juicy, with slight foxiness.

QUALITY: good.

VALUE: first class of its season.

SEASON: early.



## NIAGARA.

The Niagara is the leading white grape in Ontario, for commercial purposes. In health, vigor of vine and in productiveness it has no superior, and it has been planted more widely than any other variety except the Concord. For dessert purposes it is good in quality when well ripened. We do not recommend it for sections north of Toronto, unless in favored locations.



**ORIGIN:** raised by C. L. Hoag, of Lockport from seed of Concord, sown in 1868.

**VINE:** very vigorous; foliage thick and healthy, like Concord, hardy, not subject to mildew; very productive.

**BUNCH:** very large; often shouldered; very compact.

**BERRY:** round, about the size of Concord; pale green turning to pale yellow at maturity, and covered with a thin whitish bloom; skin tough and not inclined to crack; pulp soft, juicy and sweet, of good flavor when fully ripe, with a touch of muskiness

**QUALITY:** dessert good; canning very good.

**VALUE:** home markets first class.

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NORTHERN LIGHT.

A white grape ripening late in September; not recommended for profit.

ORIGIN: Introduced by P. E. Bucke, Ottawa, Ontario.

VINE: vigorous; healthy; moderately productive.

BUNCH: compact; shouldered.

BERRY: size medium; color white; bloom thin; flavor subacid.

QUALITY: dessert fair.

VALUE: market, hardly first class.

SEASON: late.

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## PERKINS.

An early market grape, healthy in vine and fruit, and a sure cropper.

ORIGIN: Massachusetts.

VINE: vigorous; hardy; productive and free from disease.

BUNCH: size medium; shouldered; compact.

BERRY: size medium; form roundish oblong; color amber with whitish bloom.

FLESH: texture pulpy, juicy, not melting; flavor sweet.

QUALITY: dessert poor; wine good.

VALUE: market second class; a poor keeper.

SEASON: early.

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POCKLINGTON. (*Golden Pocklington*).

This grape was first shown at the New York State Fair, Rochester, in 1877, and was at that time considered the largest and finest white grape of purely native origin, and was largely planted for commercial purposes. However, since the introduction of the famous Niagara, the Pocklington has been almost lost sight of, and is very little planted.

ORIGIN: a seedling of Concord, raised by John Pocklington, Sandy Hill, N. Y.

VINE: of medium vigor; moderately productive; healthy, resisting mildew and rot; of *Labrusca* (Concord) parentage.

BUNCH: fairly compact, with small shoulder.

BERRY: round; color pale green, turning golden yellow; flesh pulpy, but tender and fairly juicy; flavor sweet, somewhat foxy; drops from stem after gathering.

QUALITY: dessert fair.

VALUE: home market second class; distant market third class.

SEASON: about a week later than Concord.



REQUA. (*Rogers' 28*).

A fine table grape, supposed to be too late for Canada, but ripening well in the Niagara district, a sample of the kind of grape which should be grown for export, but the vine is scarcely productive enough to be profitable.



REQUA.

**ORIGIN:** E. S. Rogers, Salem, Mass.; a hybrid between the Wild Labrusca, or Mammoth Fox grape, of Massachusetts, and a European variety. Mr. Rogers produced his seedlings in 1856, and at first introduced them by their numbers only.

**VINE:** fairly vigorous and moderately productive.

**BUNCH:** large, shouldered, moderately compact, but somewhat poor.

**BERRY:** large, round; skin thin, wine color with thick bluish bloom; pulp tender, juicy; flavor sweet, sprightly; seeds two or three, of medium size.

**QUALITY:** dessert very good.

**VALUE:** first class for home or foreign market.

**SEASON:** very late.

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SALEM.

One of the finest flavored of Rogers' hybrids; worthy of a place in the home garden

ORIGIN: a hybrid between a native, the Wild Mammoth, fertilized by the Black Hamburg; raised by E. S. Rogers, Salem, Mass.

VINE: vigorous; productive; subject to black rot; foliage large, strong.

BUNCH: medium size; compact; shouldered.

BERRY: size large; form round; color chestnut red, with blue bloom; skin thick; seeds two, large.

FLESH: texture fairly tender, free from hard pulp, juicy; flavor sweet, vinous, sprightly, aromatic.

QUALITY: dessert good.

VALUE: not profitable for Ontario fruit growers.

SEASON: about with the Delaware.

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## TRANSPARENT.

Valuable in Ontario only as a wine grape.

ORIGIN: seedling of Taylor, by Jacob Rommell, of Missouri.

VINE: vigorous, productive, free from mildew and rot.

BUNCH: compact, shouldered.

BERRY: firm, round; color, pale greenish yellow, transparent. with thin grey bloom; skin thin; pulp tender, juicy; flavor fine and sweet.

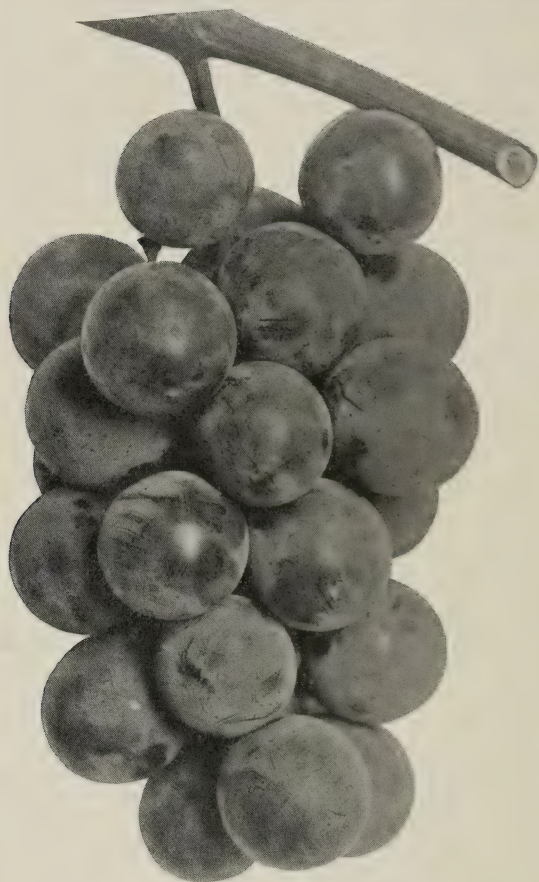
SEASON: medium.

ADAPTATION: southern sections of the Province.



## VERGENNES.

The leading grape for winter use; may be kept in a cool cellar until spring.



VERGENNES.

ORIGIN: Vergennes, Vermont; introduced about 1880.

VINE: vigorous; healthy; productive.

BUNCH: medium; slightly shouldered; rather compact.

BERRY: large; oval, persistent; color light amber to red with greyish bloom.

FLESH: color greenish; pulp tender; fairly juicy; flavor rich, pleasant, vinous.

QUALITY: dessert fair; wine good.

VALUE: market, second class in autumn, but more valuable in winter and spring.

SEASON: late, keeping all winter.

WOODRUFF. (*Woodruff's Red*).

An attractive red grape, which promises to be valuable.

ORIGIN: C. H. Woodruff, Ann Arbor, Mich., in 1874; a chance seedling thought to be a cross between Catawba and Concord.

VINE: vigorous, hardy, productive; somewhat subject to black rot.

BUNCH: good size; shouldered; compact.

BERRY: large; round; red with thin bloom; does not crack.

QUALITY: dessert good.

VALUE: market first class.

SEASON: about the same as Concord.

WYOMING. (*Wyoming Red*).

An attractive early market grape; ripens before Delaware.

ORIGIN: Wyoming Valley in Pennsylvania.

VINE: healthy; vigorous; hardy and fairly productive.

BUNCH: small; compact; attractive.

BERRY: size medium; color very bright red.

FLESH: texture tender, juicy; flavor sweet.

QUALITY: dessert fair.

VALUE: market first class.

SEASON: medium.

WILDER. (*Rogers' 4*).

Considered in many parts of Ontario the best black grape; but it is not so productive as Concord, nor as resistant of mildew.

ORIGIN: a seedling raised by E. S. Rogers, of Salem, Massachusetts, and named in honor of Marshall P. Wilder, the late president of the Massachusetts Horticultural Society.

VINE: vigorous; somewhat inclined to mildew in unfavorable seasons; but otherwise healthy; canes heavy and long, should have long pruning.



WILDER.

BUNCH: self sterile; medium size; compact, with a small shoulder.

BERRY: large; round; dark purple with slight bloom.

FLESH: texture fairly tender, juicy, somewhat pulpy; flavor rich, sweet, pleasant.

QUALITY: dessert very good.

VALUE: market first class.

SEASON: medium.



WINCHELL. (*Green Mountain*).

The best white grape of its season for the dessert table. Not much planted for market.

ORIGIN: Green Mountains of Vermont, by a Mr. Winchell, after whom it has been very properly named; but among fruit growers the name Green Mountain has the preference.

VINE: hardy, healthy, only fairly vigorous and fairly productive.

BUNCH: compact; well shouldered.



WINCHELL.

BERRY: color greenish white; size medium; skin thin; pulp tender; flavor sweet and excellent; seeds few and small.

QUALITY: dessert, good.

VALUE: market second class.

SEASON: early.

## WORDEN.

The vines of the Worden are almost identical in character and appearance with its parent, the Concord.

When first introduced it was thought to be superior to that variety for the main crop, but it has proved to be so only in its earliness, ripening a few days in advance.

ORIGIN: S. Worden, Minnettoo, N. Y., from Concord seed.

VINE: strong, vigorous grower, with coarse stout foliage, dark green above, rusty underneath; very hardy, healthy and very productive.



WORDEN.

BUNCH: large, compact, shouldered.

BERRY: large, black; skin tender, thin, with heavy bloom, cracks easily; flesh sweet when well ripened; pulp tender, and loses flavor soon after ripening; a poor keeper.

QUALITY: fair for dessert purposes.

VALUE: near market first class; berries too loose on stem for long shipments.

SEASON: early.

ADAPTATION: well suited to the northern sections because of its early ripening.



### 3. Bush Fruits.

In Bush Fruits are included the Blackberry, Currant, Gooseberry, and Raspberry. These fruits, while not being of quite so much importance from a commercial standpoint as the tree fruits, are grown and consumed in very large quantities in Ontario, and as they are used in many ways by housekeepers there will always be a demand for them. They can be grown between the tree fruits to advantage while the latter are young and hence often augment the revenue of the fruit grower materially before the tree fruits come into full bearing.

Some idea of the large quantities of bush fruits which are grown will be obtained from the Dominion census statistics for 1901, where it is stated that there were at that time 8,116 acres devoted to small fruits in Ontario, on which were produced about 16,000,000 quarts valued at \$811,000.00. The strawberry is included in the above estimate. The present area devoted to small fruits is estimated at 10,000 acres.

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#### THE BLACKBERRY.

The blackberry is not grown so largely in Ontario as it might be. It is one of the most profitable fruits to grow where it succeeds well, but as the crop is rather uncertain except in southern Ontario and in localities farther north where it is protected by a deep snow fall, its range of successful culture is somewhat limited. Where there is not danger of winter killing, a well drained clay loam is probably the best for the blackberry, as it is cooler and more retentive of moisture than lighter soils. The blackberry must have plenty of soil moisture when the fruit is ripening, otherwise but little of the crop will develop. Further north, where hardiness is of greater consideration than conservation of moisture, the poorer and warmer soils are preferred, as the blackberry on these soils does not make as rampant a growth and hence ripens its wood better.

The blackberry may be planted in late fall or early in the spring. If planted too early in the fall young growth may start which is likely to be winter killed. The soil should be well prepared and the plants set a little deeper than they were in the nursery, in rows about eight feet apart and three feet apart in the rows. Some growers prefer planting them in hills seven or eight feet apart each way, thus finding them easier to control. Larger fruit is so produced as they can be kept cultivated both ways. Summer pruning is important with the blackberry, as the lower the canes can be kept the better they are likely to come through the winter, and the easier they are to handle. Summer pruning consists in merely pinching back the young growth to within about eighteen inches of the ground, after which side shoots will be thrown out. It is better to err on the side of low pinching than to let the canes get too tall. This summer pruning may, if delayed, cause late growth which will not ripen; hence it should be done in time or not at all. In the spring the laterals should be headed back to within eighteen inches or two feet of the main canes. Old canes and the weakest of the new ones should be cut out in the fall or early in the spring each year. There will be a light crop of fruit the second year and a full crop the third year. Four or five full crops are about as much as should be taken from one plantation.

Blackberries should not be picked until they are ripe. This fruit will never increase in popularity if fruit growers persist in marketing green blackberries, as they are quite unpalatable, whereas the ripe fruit has a fine flavor.

#### VARIETIES RECOMMENDED.

##### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

Agawam, Snyder, Eldorado, and for southern sections, Kittatinny.

##### DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Burlington District:* By A. W. Peart, Burlington, Ont.

*Commercial and Domestic:* Snyder, Briton, Triumph, Agawam, Taylor.

*Lake Simcoe District:* By G. C. Caston, Craighurst, Ont.

*Commercial and Domestic:* Agawam, Eldorado.

### DESCRIPTION OF VARIETIES.

#### AGAWAM.

A profitable variety, and a favorite for the table.

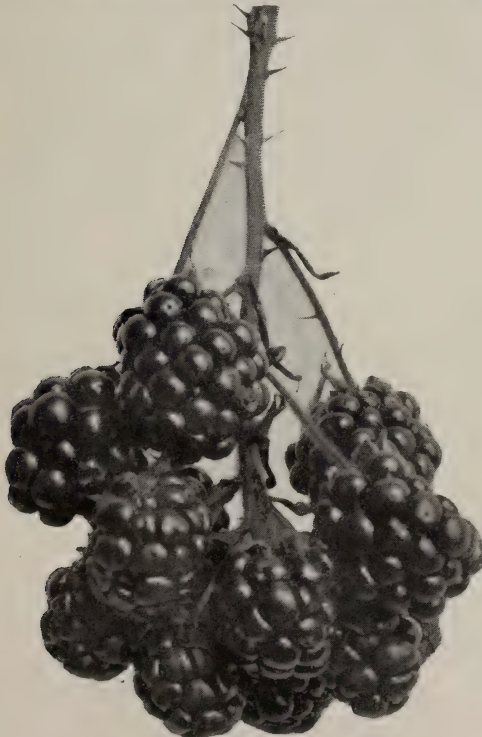
**ORIGIN:** found growing wild by John Perkins, Ipswich, Mass., about 1870.

**PLANT:** hardy, vigorous and productive, resistive of drouth.

**BERRY:** oblong, medium size, black, sweet, tender and of good flavor.

**SEASON:** early.

**ADAPTATION:** succeeds in nearly all fruit sections; one of the hardiest varieties. and therefore planted in Northern sections in preference to Kittatinny.



AGAWAM.



BRITON. (*Ancient Briton*).

Counted one of the best varieties where it succeeds; it is a special favorite with fruit growers in Wisconsin, in which State it originated.

ORIGIN: a Wisconsin seedling found by A. H. Briton; first mentioned in the Report of the Wisconsin Horticultural Society, 1869.

PLANT: hardy, vigorous and fairly productive. Budd in his "Systematic Pomology," speaks of it as one of the hardiest varieties yet tested.



BRITON.

BERRY: medium to large; form oblong, conical; texture, melting; flavor very pleasant.

SEASON: medium.

## ELDORADO.

A hardy and productive variety.

ORIGIN: accidental seedling near Preble, Ohio, about 1882.

BUSH: a strong, vigorous grower; healthy; hardy; moderately productive.



ELDORADO.

BERRY: medium to large; oblong, conical, irregular; drupes large; seeds and core small; flavor sprightly, pleasant.

QUALITY: table very good.

VALUE: market first class.

SEASON: early.

## ERIE.

A variety much like the old Lawton; has not become popular in the commercial plantations of Ontario.

ORIGIN: Ohio, on the farm of L. B. Pierce, who thinks it is a cross between Lawton and Kittatinny; introduced by J. T. Lovett in 1886.

BUSH: fairly vigorous; fairly hardy; productive.

BERRY: form roundish, oblong; size, medium; color black; flavor fairly good.

QUALITY: cooking good.

VALUE: market second class.

SEASON: medium.



## KITTATINNY.

This has been the favorite blackberry in Ontario for both home use and market. Unfortunately, it is subject to Orange Rust, for which as yet there is no certain remedy, and in some places fruit growers have given up this variety on account of it.

**ORIGIN:** Kittatinny Mountains, N. J.; found growing wild by a Mr. Woolverton in 1874, but not much disseminated until many years later.

**PLANT:** very vigorous, but tender outside of the peach belt; productive; propagated by suckers and by root cuttings.



**BERRY:** large, oblong, slightly conical; shiny black when ripe, becoming gradually duller after gathering; flesh moderately firm, sweet, rich and excellent.

**QUALITY:** good for dessert; very good for cooking.

**VALUE:** first class for home market.

**SEASON:** medium to late.

## LAWTON.

A variety that has done much to popularize the blackberry as a market fruit, but now supplanted by other and better kinds. In some markets all varieties of blackberries go under the name of Lawton.

ORIGIN: introduced by Wm. Lawton, of New Rochelle, N. Y., in 1848.

BUSH: vigorous; hardy; productive; canes very spiny.

BERRY: large; oblong; color jet black when fully ripe, but if gathered sooner it is reddish; texture soft and juicy at full maturity, otherwise it has a hard core, and is sour and insipid; flavor sweet and excellent when quite ripe, but in this condition rather soft for shipment.

QUALITY: cooking good.

VALUE: market second class.

SEASON: medium.

## MINNEWASKI.

Introduced with great flourish, but it has proved disappointing, except in the place of origin, because tender and unproductive.

ORIGIN: by A. J. Caywood, of Marlboro, N. Y.

PLANT: a stout, vigorous, upright grower, but unproductive and tender.

BERRY: large, oblong, dull in color, and of fair quality.

SEASON: medium.

## OHMER.

An excellent late blackberry, for home use and for market.

ORIGIN: a chance seedling found by N. Ohmer, of Ohio.

BUSH: vigorous; spreading; very productive.

FRUIT: roundish; black; large; firm without core; juicy; flavor mild, pleasant.

QUALITY: second rate.

VALUE: market first class.

SEASON: medium.



SNYDER.

## SNYDER.

A popular variety in the commercial fruit garden, because of its productiveness; very reliable in the colder sections, but not desirable for the table because of its inferior quality.

ORIGIN: on farm of Henry Snyder, near Laporte, Indiana, about the year 1851.

PLANT: a vigorous, stout, upright grower, hardy and very productive.

BERRY: medium size, roundish, firm and carries well.

SEASON: medium.



TAYLOR. (*Taylor's Prolific*).

A valuable commercial berry for colder sections, its season being later than Snyder.

ORIGIN: introduced by Mr. Taylor, of Spiceland, Indiana, about the year 1867.

BUSH: hardy, vigorous and productive.



TAYLOR.

BERRY: large; roundish oblong; texture soft, juicy; flavor rich, moderately sweet.  
SEASON: medium to late.

TRIUMPH. (*Western Triumph*).

A good market berry, if grown on favorable soil.

ORIGIN: a chance seedling, found in Illinois, on the prairie, in 1858.

BUSH: moderately vigorous; very productive, inclined to overbear; requires moist bottom and close pruning for best results; semi-hardy.

BERRY: size medium; form roundish oblong; drupelets coarse; flavor sprightly, rich and sweet, without core.

QUALITY: fair.

VALUE: market first class

SEASON: medium to late.

## WACHUSETT.

This blackberry was first introduced as Wachusett's Thornless, on account of its comparative freedom from spines. This, however, is the chief point in its favor, as the plant is not productive enough to be of value to the Ontario fruit grower.

ORIGIN: a wild plant on Monadnock Mountain, Massachusetts.

BUSH: a slow grower, at first upright, afterward drooping; healthy, not very productive; spines few; fruit clusters few.

BERRY: size medium; form roundish, moderately firm, of good quality.  
of good quality.

VALUE: market second class.

SEASON: early to medium.

## THE CURRANT.

The currant is a very hardy fruit and for this reason can be grown with success all over the Province of Ontario, and as fair results are obtained without high culture, almost everyone who has a garden grows currants. Like all other fruits, however, the currant becomes most profitable when it is given good care.

The currant is a moisture loving fruit, hence for profit it should be planted in a cool, moist, but well drained soil. It also requires rich soil, hence as a rule the best is a good clay loam which is retentive of moisture and cooler than sandy loam. The soil should be thoroughly prepared for currants before planting. One year old plants from cuttings if strong will give good satisfaction, although two year old plants are not too old. They should be planted in rows about six feet apart, and from four to five feet apart in the rows, the wide distance being more satisfactory for the strong growing varieties and especially black currants. Fall planting is best for currants, as the buds start very early in the spring and should these develop before they can be planted, their future growth will be checked. Then can, however, be planted in the spring with success. The plants should be set a little deeper than they were in the nursery, and the soil well pressed against the roots. Thorough cultivation should follow to promote as much growth as possible, but it should be shallow, as the currant roots are near the surface. The following spring the currants will need some pruning to give them a shapely open head, the bush when well shaped having from five to seven main branches well distributed to avoid crowding. The fruit of red currants is formed from spurs on wood two years old, while the fruit of black currants is borne on wood of the previous year. Currants should be pruned annually to get the best results.

After the bushes are in full bearing, the pruning should be done with the object of removing some of the young and some of the older wood from the ground each year. There should be no wood more than three years old left on black currant bushes, as the object is to keep up a strong growth of young wood. It is also not well to let the wood of red currants get very old, as the finest fruit is produced on the two and three year old wood.

The currant plantation will begin to give some fruit the third season, but a full crop will not be obtained until the fourth.

As the currant is a great feeder, drawing heavily on the fertility of the soil, the plantation should receive an annual dressing of barnyard manure or some other fertilizer. Rotten manure applied in the autumn and cultivated in the next spring gives very good results. Applications of wood ashes or muriate of potash and ground bones are also beneficial.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

*Black:* Black Victoria, Champion, Lee, Naples, Saunders.

*Red:* Cherry, Fay, Pomona, Red Cross, Victoria, Wilder.

*White:* White Grape.

#### DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Burlington District:* By A. W. Peart, Burlington, Ont.

*Commercial:* *Black:* Lee, Naples, Saunders.

*Red:* Cherry, Fay, North Star, Prince Albert, Victoria, Wilder.

*White:* White Grape.

*Lake Huron District:* By A. E. Sherrington, Walkerton, Ont.

*Black:* Champion, Naples, Saunders.

*Red:* Pomona, Red Cross.



## DESCRIPTION OF VARIETIES.

### BLACK VICTORIA.



BLACK VICTORIA.

BUSH: upright, of medium vigor, healthy, hardy and productive.

BERRY: large, black, firm, sweet.

QUALITY: fine.

SEASON: medium.

### BRAYLEY.

BUSH: upright, spreading, vigorous, healthy, hardy; not very productive.

BUNCH: long, straggling, loose.

BERRY: dark red in color; size medium; flavor acid, sprightly.

SEASON: medium.

### CHERRY. (*Red Imperial, Fertile d'Angers of LeRoy*).

The principal red currant grown in Southern Ontario for commercial purposes. Its large size, fine color and earliness, combine to make it the most satisfactory of all varieties for market, and many acres have been set out for this purpose. When well cultivated and well pruned back, a plantation of Cherry currants will continue very productive for at least twelve or fifteen years.

ORIGIN: Italy; introduced into the United States in 1846.

PLANT: vigorous, a stout stocky grower; very productive; begins bearing the second year after planting; foliage thick, dark green.

BUNCH: usually short, but sometimes long and tapering, compact.

BERRY: very large, globular; bright red in color; flavor subacid; texture firm.

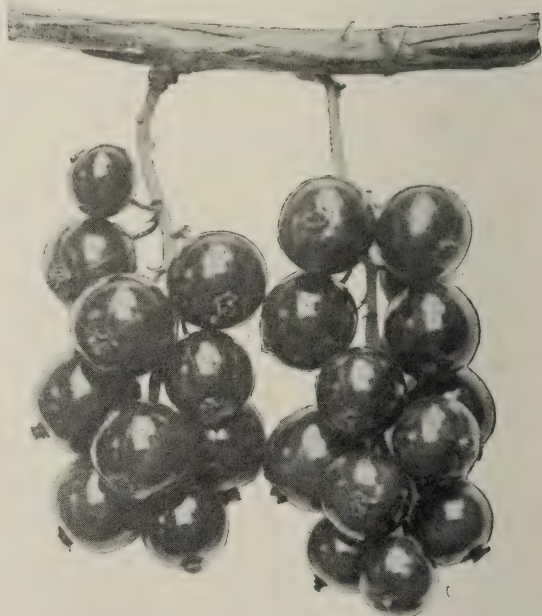
QUALITY: fair.

VALUE: first class for market and for jellies.

SEASON: medium to late.

ADAPTATION: general, but succeeds better on clay loam than upon light sand.

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CHERRY.

## CHATAUQUA.

ORIGIN: New York State.

PLANT: vigorous; very productive.

BUNCH: long; compact.

FRUIT: deep, bright red; about size of the Cherry currant; flavor acid.

QUALITY: good.

VALUE: market first class.

SEASON: medium.

## CRANDALL.

This interesting currant is of very doubtful value for the currant plantation, for canning. It is of the *Ribes aureum* type, or flowering currant, and was produced from seed of that variety by Mr. Crandall.

ORIGIN: Kansas.

BUSH: upright, spreading, hardy, healthy, vigorous, rampant and moderately productive.

BUNCH: short, compact.

BERRY: variable in size; bluish black; skin thick; flavor sprightly, sub-acid.

SEASON: medium to late; ripens unevenly, some of the later berries hanging until frost.



FAY.

FAY. (*Fay's Prolific*).

A variety that has been much advertised as superior to the Cherry, but, as a matter of fact, is very similar in fruit and in productiveness.

ORIGIN: New York State.

BUSH: vigorous, but sprawling, and somewhat subject to the borer where the shoots are not frequently renewed; productive.

BUNCH: moderately close, loose toward the base.

BERRY: very large, globular; bright red; firm; flavor subacid.

QUALITY: good.

VALUE: first class for market.

SEASON: medium to late.



HOLLAND. (*White Holland, Long Bunched Holland*).

The best bunched and the most showy of the white currants.

BUSH: vigorous, healthy and quite productive.

BUNCH: loose at base of racemes, close toward apex.

BERRY: globular; skin thick, white; flavor mild acid.

SEASON: medium.

LEE.



LEE.

A good commercial variety.

ORIGIN: England.

BUSH: moderately vigorous, healthy, hardy and moderately productive.

BERRY: black, very large; flavor sub-acid; quality, very good.

SEASON: medium.

LONDON. (*London Market*).

One of the most promising of the new varieties for all purposes.

ORIGIN: England.

BUSH: very vigorous, healthy, very productive.

BUNCH: comparatively compact.

BERRY: color red; quality fair.

VALUE: very good for both kitchen and market.

SEASON: medium.

MIDDLESEX. (*Saunders' 12*).

ORIGIN: with Dr. Saunders, Ottawa, Canada.

BUSH: very vigorous, healthy, very productive.

BUNCH: compact.

BERRY: round; skin jet black, thick; flavor good.

VALUE: first class for cooking and market.

SEASON: medium.

## NAPLES.

One of the best market varieties of black currants.

ORIGIN: Europe.

BUSH: upright, strong, vigorous, hardy, healthy and very productive.

BERRY: large, black, sub-acid.

QUALITY: good.

SEASON: medium to late.



NAPLES.

## NORTH STAR.

ORIGIN: Minnesota.

BUSH: vigorous, healthy, moderately productive.

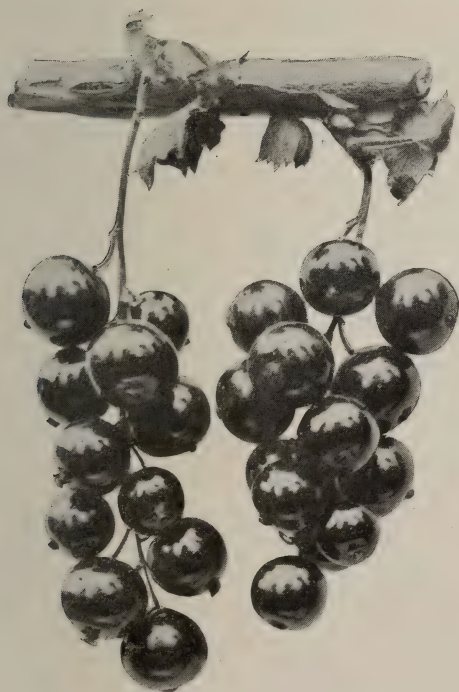
BUNCH: compact.

BERRY: round; skin thin, bright red; sub-acid.

QUALITY: cooking very good.

VALUE: second class on account of size, but, season and productiveness considered, it might be rated first class.

SEASON: medium to late.



NORTH STAR.



## PRINCE ALBERT.

One of the most profitable red currants; excellent for canning.



PRINCE ALBERT.

## RED CROSS.

Very much resembles Cherry, but somewhat poorer in bunch.

ORIGIN: New York State, probably a cross between the Cherry and the White Grape.

BUSH: upright; vigorous; hardy; fairly productive.

BUNCH: compact.

BERRY: round; color bright red; flavor fairly good, agreeably acid.

SEASON: medium.

BUSH: a poor grower while young, but as it grows older quite vigorous and productive. Beach, of Geneva, N. Y., in a three years' test found this the most productive currant in his collection, yielding, during that period, an average of about nine pounds per bush; leaves large and deeply cut.

BUNCH: short to medium length.

BERRY: size medium; color light red; flavor very acid.

QUALITY: first class for cooking or jelly.

VALUE: market first class.

SEASON: late.



RED CROSS.

## RED DUTCH.

Too small for the commercial plantation; fine flavor for dessert.

ORIGIN: Europe.

BUSH: dwarfish, slender; hardy; very productive.

BUNCH: medium; loose.

BERRY: small, oblate, sprightly, sub-acid, pleasant.

VALUE: second class for market.

SEASON: medium.

ST. GILES. (*Belle de St. Giles*).

This is a large berry of fine quality, but not productive enough for the commercial plantation.

ORIGIN: Europe.

BUSH: upright, spreading; vigor medium; hardy, not very productive.

BUNCH: large and compact.

BERRY: red, large, subacid.

QUALITY: excellent.

SEASON: medium.

## SAUNDERS.

A very promising black currant.

ORIGIN: London, Ontario, by Dr. Wm. Saunders.

BUSH: vigorous; hardy; healthy; productive.



SAUNDERS.

BERRY: large; black; flavor sweetish or subacid.

QUALITY: very good.

VALUE: market first class

SEASON: medium.



## VICTORIA.

A good commercial variety.

ORIGIN: England.

BUSH: very vigorous; hardy; very productive.

BUNCH: long, loose.

BERRY: medium; color red; firm; flavor acid.

VALUE: market first class.

SEASON: medium.



VICTORIA.

## VERSAILLAISE.

This variety closely resembles Cherry.

ORIGIN: France.

BUSH: healthy, hardy, fairly vigorous and fairly productive.

BUNCH: medium and moderately compact.

BERRY: round; bright red; flavor milder than that of the Cherry.

VALUE: market first class.

SEASON: medium to late.



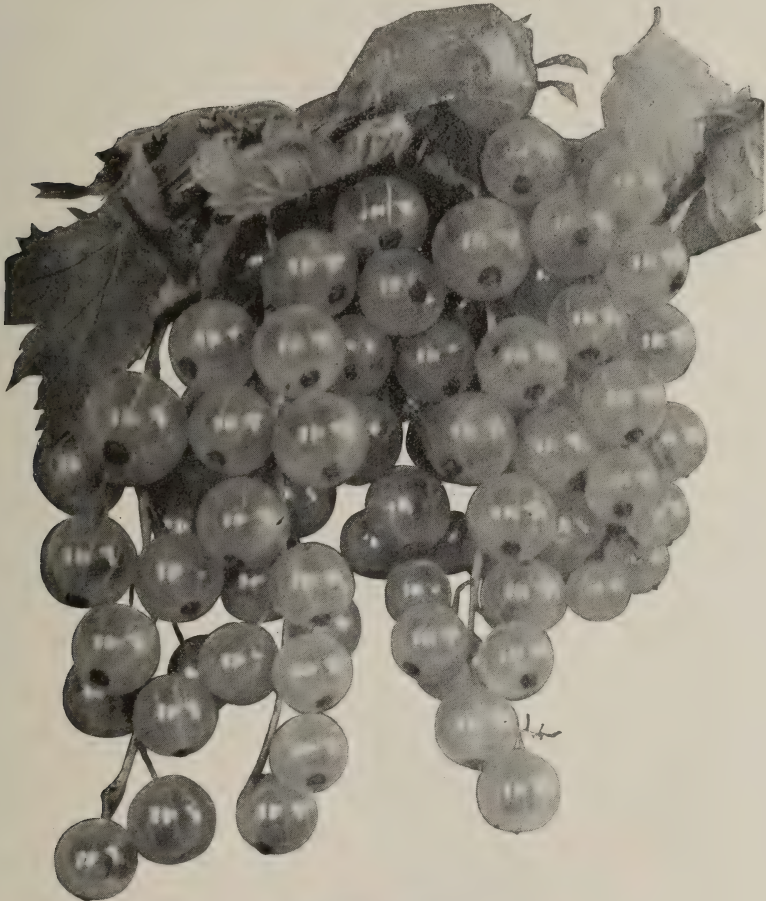
VERSAILLAISE.

**WHITE GRAPE.** (*White Antwerp; White Transparent*).

This is esteemed the finest of all the white currants, when its many good points are taken into consideration, viz., quality, beauty and productiveness. For market, its white color is against it, but for the home garden it is one of the best.

**ORIGIN:** Europe.

**BUSH:** moderately vigorous; hardy; very productive.



WHITE GRAPE.

**BUNCH:** somewhat straggling.

**BERRY:** skin white, transparent; flavor mild acid, sprightly, agreeable.

**QUALITY:** best for dessert.

**VALUE:** first class for market.

**SEASON:** medium.



## WHITE IMPERIAL.

BUSH: vigorous, hardy, healthy and fairly productive

BUNCH: loose, with half an inch of stem.

BERRY: white; flavor mild; quality fine.

QUALITY: dessert very good.

SEASON: medium.



WILDER

## WILDER.

This is one of the best of the red currants and has given an excellent record at our Burlington station. It is highly recommended in a recent report of the American Pomological Society.

ORIGIN: New York State, named in honor of the late Marshall P. Wilder.

BUSH: healthy, hardy and very productive.

BUNCH: compact.

BERRY: dull red; form uneven; mild in flavor; of good quality.

VALUE: first class for market.

SEASON: medium.

## THE GOOSEBERRY.

The gooseberry and the currant are the two hardiest bush fruits which are cultivated, and the gooseberry, like the currant, succeeds in all parts of the Province, although the hardy gooseberries are confined to the varieties derived from the native species and to crosses between the native and the European. The European varieties are only grown successfully in favored locations as in most places they are very subject to mildew.

The gooseberry, like the currant, requires a cool, moist, though well drained soil to give the best results, and suffers more than almost any other fruit in a dry time. These cool, moist conditions are best obtained as a rule by planting in a well drained friable clay loam. The soil should be thoroughly prepared, as although the gooseberry will give a fine crop of fruit, even if not well cared for, the size will be small. Gooseberries may be planted with success either in spring or fall, but fall planting is preferable, as growth begins early and plants usually receive a severe check if planted in the spring.

A good distance for planting is six by four or five feet. As gooseberries and currants are usually planted together, it is best to give them both the same distance so that cultivation will be easier. The soil should be well cultivated every year to retain moisture. As the gooseberry makes much more wood each year than is needed, annual pruning is necessary.

The pruning should be begun before growth starts the second year, and with the object of obtaining an open bush having four or five main fruiting branches well distributed. The annual pruning should consist of removing most of the young branches, leaving a few of the best to take the place of some of the older ones later on and removing enough of the laterals to open up the head.

The gooseberry produces its fruit on spurs on wood two or more years old, hence there should always be a fair amount of this wood. Wood more than three years old should be removed to give place to that which is younger and which will bear better fruit.

The soil should be well fertilized and treated in this respect much like the currant.

The bushes will bear some fruit in the third season and should have a full crop in the fourth.

Although in England and Europe ripe gooseberries are highly esteemed, few of them are eaten raw in Ontario, hence this fruit is usually picked green and used for sauce, canning and pies. Being firm, it ships well and is usually a profitable crop.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

Pearl, Downing, Red Jacket. Whitesmith is one of the best English varieties, but is almost valueless on some soils and in some localities owing to mildew.



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## DESCRIPTION OF VARIETIES.

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### CHAMPION.

A valuable variety for market in green condition.

ORIGIN: at Salem, Oregon.

PLANT: very vigorous; of easy cultivation; fairly productive.

BERRY: size about equal to that of Downing; form round oval; skin greenish yellow, thin, tender; flavor fair.

QUALITY: fair.

VALUE: market second class.

SEASON: early.

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### CROWN BOB.

A profitable gooseberry.

BUSH: inclined to overbear, and thus exhaust its vitality; drooping in habit.

BERRY: oblong, very large, especially if thinned before it is full grown; skin thin, hairy; color red; of very good flavor, but being an English variety is subject to mildew.

SEASON: early.

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### DOWNING.

This has been the most popular gooseberry of American origin for some years, unless we except the Pearl, a variety of Canadian origin, very similar in size and appearance. It is very widely known and planted all over the continent of North America. It is not subject to mildew, and succeeds splendidly everywhere.

ORIGIN: by Chas. Downing, Newburgh, N. Y.; a seedling of Houghton.

PLANT: first rate in health and vigor and productiveness; an upright grower.

FRUIT: size medium; form round, often somewhat narrowed toward apex; skin smooth, transparent green with distinct light green ribs, and a thin whitish bloom.

FLESH: light green; tender; sweet and good.

VALUE: for market first class.

SEASON: medium.



DOWNING. (slightly reduced).

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### KEEPSAKE.

A very good commercial gooseberry, which succeeds in many parts of Ontario.

ORIGIN: England.

BUSH: vigorous; productive; very little subject to mildew.

BERRY: medium to large; form nearly round; color greenish white; skin smooth; flavor sweetish.

QUALITY: very good.

VALUE: market first class.

## PEARL.

The Pearl gooseberry has been widely planted in the commercial gardens of Canada and the United States. It is certainly a magnificent cropper, but it is very difficult indeed to distinguish the berry from the Downing, except that it averages a trifle larger.

ORIGIN: London, Ontario, by Mr. Saunders; a cross between Houghton and Red Warrington.

PLANT: healthy, not subject to mildew; upright, spreading; first rate in vigor and in productiveness.

FRUIT: medium, round, often narrowing toward apex; skin smooth, transparent green, with thin whitish bloom and light green ribs.

FLESH: light green, tender, sweet and good.

VALUE: market very much the same as Downing.

SEASON: medium.



PEARL.



RED JACKET. (*Josselyn*).

One of the best gooseberries for the Ontario fruit grower, either for home use or for market.



RED JACKET.

ORIGIN: at London, Ont., by Dr. Wm. Saunders.

PLANT: an excellent grower; free from mildew; almost equal to Pearl in productiveness.

BERRY: form round oval; color reddish green, shading into red; skin smooth and transparent, rather tender; texture juicy; flavor rich.

QUALITY: cooking very good.

VALUE: market first class.

SEASON: medium.

## WHITESMITH.

One of the best of the English varieties for cultivation in Ontario; succeeds on clay land, with northern aspect. On the sandy soil of the Niagara district it is much affected by mildew.

ORIGIN: England.

PLANT: upright, fairly productive, fairly vigorous.

FRUIT: large, oval, downy, with distinct regular veins green, and when ripe sweet and agreeable.

QUALITY: very good for home uses.

VALUE: first class for market.

SEASON: early.

## THE RASPBERRY.

Next to the strawberry, the raspberry is the most popular bush fruit grown in Ontario, and as it follows the former in season the consumer is well supplied with these two fruits most of the summer. The raspberry being a native of Ontario, is hardy in almost all parts of the Province, hence it is cultivated over a very wide area.

Like the other bush fruits, the raspberry does best when grown in a cool, moist, but well drained soil. While this soil should be of good quality, if it is very rich in nitrogen the growth may be too rank and in some localities the canes on this account are more liable to winter injury. The best success is usually obtained with a good clay loam, although the raspberry will do fairly well in most kinds of soil. The preparation of the land should be the same as for other bush fruits. The plants may be set either in fall or spring, although if young growing suckers are used they may be planted successfully any time in the early part of the summer where the soil is moist. Red raspberries are usually planted in rows six feet apart with the plants three feet apart in the rows, although they may be cultivated longer and better if grown in hills about five feet each way, and for the amateur this is the best way to grow them. The cultivation of the raspberry should be thorough to retain moisture, as in the fruiting season a good supply of moisture is very important. Some growers prefer pinching back the canes in summer when they are from eighteen inches to two feet in height, believing that they get a better crop by so doing, but this system is not recommended as it has been found by experiments that red raspberries succeed better when the growth is not headed back in summer. Sometimes, also, the pinching is delayed and the laterals which are made do not ripen thoroughly and the canes are injured by winter. It is best to let the canes make full growth in summer and if they are very tall they may be headed back to three or four feet in height before growth begins in the spring. Black raspberries are planted most successfully in the spring. They should be set rather shallow, as if planted deep they will not grow. Stockier plants will be obtained if the plants are set in a furrow and lightly covered with soil, applying more soil as the plants grow until the field is level. Pinching back in summer is a good practice with black raspberries, as it makes the plants stockier and better able to withstand storms. The thinning out of the canes may be done in fall or spring. Seven or eight of the strong canes of red raspberries to a hill and three or four of black raspberries are sufficient to leave. If the raspberries are grown in a hedge row the weakest canes should be removed, leaving those which are to fruit about six inches apart. The raspberry plantation should be kept well supplied with plant food, but a too liberal use of nitrogenous fertilizers, as previously stated, should be avoided.

In the colder parts of the country it is a very good practice to bend the canes down in the fall for better protection in winter, the canes being held in place by covering the tips with soil. By adopting this plan serious winter injury rarely occurs.

### VARIETIES RECOMMENDED.

#### GENERAL LIST, APPROVED BY THE BOARD OF CONTROL.

*Black:* Hilborn, Older, Gregg, Smith Giant.

*Purple:* Columbian, Shaffer.

*Red:* Marlboro, Herbert, Cuthbert.

*White:* Golden Queen.

#### DISTRICT LISTS, RECOMMENDED BY THE EXPERIMENTERS.

*Lake Huron District:* By A. E. Sherrington, Walkerton, Ont.

#### *Commercial and Domestic:*

*Black:* Hilborn, Conrath, Older.

*Purple:* Columbian, Shaffer.

*Red:* Marlboro, Herbert, Cuthbert.



## DESCRIPTION OF VARIETIES.

### CAROLINE.

A very productive variety, but of little use for market because too soft for shipping, and not in favor for home use because of its ordinary quality.

ORIGIN: at New Rochelle, N. Y., by S. P. Carpenter; supposed seedling of Brinckle's Orange.

FRUIT: medium size; form round; color pinkish yellow; seeds small, close; easily parted from each other and from stalk; flesh juicy, sweet, lacking in flavor.

QUALITY: only fair for all purposes.

VALUE: second class for market.

SEASON: early.

### CONRATH.

One of the best blackcaps for profit.



ORIGIN: Michigan, in 1886; a chance seedling near Ann Arbor; introduced by Conrath Bros.

BUSH: vigorous, healthy, productive, resistant to drouth.

BERRY: large; firm; black.

QUALITY: good for either cooking or dessert.

VALUE: for market very good.

SEASON: early.

ADAPTATION: succeeds well at our Lake Huron station. Highly recommended in Catalogue of American Pomological Society for Ontario, Michigan and New York.

CONRATH (slightly reduced).

## COLUMBIAN.

Valuable for cooking, canning and table use; but not popular in color as a market berry.

ORIGIN: a supposed seedling of Cuthbert, crossed with Gregg, at Oneida, N. Y.

PLANT: a strong, vigorous grower; very productive.

BERRY: size large; color purple; texture fairly firm, moderately juicy; flavor nearly sweet.

QUALITY: very good for cooking; fair for dessert.

VALUE: market second class.

SEASON: medium.

CUTHBERT. (*Queen of the Market*).

Previous to the introduction of the Cuthbert, many varieties of raspberries were grown for profit, such as Turner, Philadelphia, Highland Hardy, etc., but these have given place entirely and are heard of no longer. So prolific has this variety proved itself that acres have been planted by fruit growers throughout Ontario, and immense quantities of its fine fruit sent into our best markets. A favorite for canning factories.



CUTHBERT.

ORIGIN: chance seedling in the garden of Thomas Cuthbert, Riverdale, N. Y.

PLANT: vigorous, canes strong, often six feet high or more on rich sandy loam not too dry; sometimes branching; very productive; spines short, stout, numerous; suckers almost too freely and young growth needs to be kept within bounds.

FRUIT: large; color bright crimson; form conical, obtuse at apex; seeds small, compact, part easily from stalk when very ripe; flesh firm, fairly juicy, sweet, agreeable.

SEASON: medium.

QUALITY: very good for cooking; good for dessert.

VALUE: first class for market.

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## CUMBERLAND.

A promising black cap.

ORIGIN: by David Miller, Camp Hill, Pennsylvania, in 1896.

PLANT: vigorous; productive.

BERRY: size very large; form oval; color black; texture firm; flavor very pleasant.

QUALITY: dessert or cooking very good.

VALUE: market first class.

SEASON: early.

## GOLDEN QUEEN.

A good yellow variety; not grown for market, the red colored varieties being more in demand.



ORIGIN: New Jersey; a sport of the Cuthbert; 1883.

BUSH: vigorous; very productive; hardy.

BERRY: medium to large; roundish conical; color rich golden yellow; similar to Cuthbert except in color.

FLESH: tender; juicy; sweet.

QUALITY: dessert good; cooking good.

VALUE: market second class.

SEASON: medium.

GOLDEN QUEEN.

## GREGG.

One of the best late blackcaps for market purposes; an excellent shipper and also much valued for evaporating.

ORIGIN: on the Gregg farm, Ohio County, Indiana, in 1866.

PLANT: vigorous; fairly hardy; canes upright, clean and smooth, rather difficult of propagation; very productive.

BERRY: size large; color black with grey bloom; texture firm, moderately juicy; flavor sweet.

SEASON: late.



GREGG.

## HERBERT.

A valuable red raspberry for the commercial plantation; combining the good qualities, hardiness, productiveness and earliness.

ORIGIN: a chance seedling in the garden of Mr. R. B. Whyte, Ottawa, about the year 1890; introduced by the Renfrew Nursery Company.

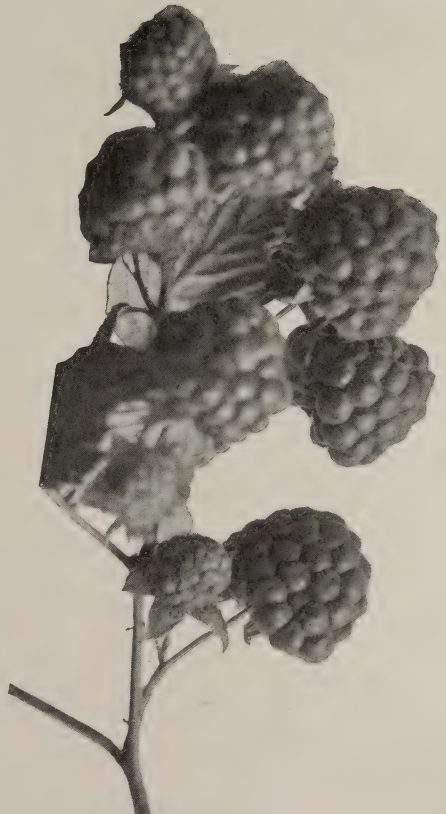
BUSH: hardy, enduring the cold winters at Ottawa with a temperature of 30 below zero; vigorous; about equal to Cuthbert; productive.

BERRY: large; color bright red; form, somewhat oblong; texture a little tender, juicy; flavor sweet and excellent.

QUALITY: very good for all purposes.

VALUE: market, first class.

SEASON: earlier than Cuthbert.



HERBERT.



## HILBORN.

A favorite blackcap for market in some localities.



HILBORN.

ORIGIN: a chance seedling, introduced by W. W. Hilborn, of Leamington, Ontario, in 1886.

BUSH: hardy; vigorous; productive.

FRUIT: medium to large, about the size of Gregg; color black; texture firm, juicy; flavor rich and good.

QUALITY: first class for dessert or cooking.

VALUE: market first class.

SEASON: early.

## KANSAS.

One of the newer blackcaps.

ORIGIN: chance seedling in Kansas, U. S., about 1884.

BUSH: vigorous; very thorny; propagation easy; tender in Lake Huron District.

BERRY: large; roundish; color shining black.

FLESH: firm; moderately juicy; flavor mild, pleasant.

QUALITY: very good for canning, pies, etc.

VALUE: market first class.

SEASON: medium.

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LOUDON.

A good market variety, the berries being a little larger than Cuthbert, but not quite equal to it in quality.

ORIGIN: raised by F. W. Loudon, of Wisconsin, from seed of Turner crossed with Cuthbert.

PLANT: hardy; very productive; but not very vigorous; canes very slightly branched, and have strong buds which produce the fruiting branches; pinching back the tips is therefore not wise.

BERRY: size large; form conical; color red, attractive; grains large, inclined to crumble; texture firm; flavor fair.

QUALITY: dessert or cooking fair.

VALUE: first class for market.

SEASON: medium.

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MARLBORO.

This raspberry has been coming gradually to the front ever since its introduction about the year 1880. The old Highland Hardy for a while disputed its place as an early market berry, but the superior size and beauty of the former soon caused the latter to give place entirely, until Marlboro and Cuthbert have been for many years the two leading varieties of red raspberries to cover the season.



MARLBORO.

PLANT: fairly vigorous; canes short, stout, upright, without branches; propagated by suckers; fairly productive.

BERRY: round; color light red; seeds close and firm; flavor mild, pleasant; texture rather seedy.

QUALITY: fairly good.

VALUE: market first class.

SEASON: early.

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MILLER.

A promising berry for near markets.

ORIGIN: found near Wilmington, Delaware.

PLANT: strong; vigorous; hardy; productive.

BERRY: medium; color bright red; texture tender; flavor sweet, pleasant.

QUALITY: very good.

SEASON: early.



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OLDER.

A popular blackcap in Iowa; counted a failure in Michigan; reported upon favorably at our Lake Huron station.



OLDER.

ORIGIN: a chance seedling in the garden of Mr. Older, of Independence, Iowa, in 1872.

PLANT: vigorous; hardy at Ottawa, Guelph and Walkerton; canes of a trailing nature and need cutting back; endures drouth well; very productive.

BERRY: large; color jet black without bloom; texture juicy and moderately firm; flavor pleasant.

QUALITY: good.

SEASON: early to medium.

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PHŒNIX.

Considered a profitable market variety for some growers, but by others reported as only moderately productive.

ORIGIN: United States.

BUSH: fairly vigorous; hardy; not very productive.

BERRY: large; red.

QUALITY: very good.

SEASON: medium.

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RELIANCE.

A fairly good early table berry; rather soft for shipment; resembles Turner.

ORIGIN: New Jersey; a seedling of the Philadelphia raspberry.

BUSH: healthy; canes strong and vigorous; very productive.

BERRY: size medium; color dark red; texture inclined to be soft and juicy; flavor sweetish, ordinary.

QUALITY: dessert and cooking fair.

VALUE: first class for near market; second class for shipping

SEASON: early.

## SHAFFER.

On its first introduction the Shaffer created much enthusiasm by reason of its thrift, productiveness and good quality. It is still considerably grown for canning purposes, but its color is not a favorite one in the market.



SHAFFER.

ORIGIN: on farm of Mr. Shaffer, Wheatland, N. Y., in 1869; introduced by Chas. Green, Rochester, in 1881.

PLANT: very vigorous; canes grow six or seven feet high, if not pinched back; very productive; propagates from tips.

FRUIT: large; color purple; form roundish; grains large, loose, easily separated from stalk; flesh very juicy and tender; flavor sweet, rich and very agreeable.

QUALITY: very good for cooking; good for dessert.

VALUE: second class for market.

SEASON: medium.



## SMITH GIANT.

A very promising black raspberry for the commercial plantation.

ORIGIN: with A. M. Smith, St. Catharines, Ont.

PLANT: vigorous, fairly hardy and quite productive.

FRUIT: very large; black, with heavy bloom.



SMITH GIANT.

QUALITY: dessert or cooking very good.

VALUE: market one of the best.

SEASON: late.

## TURNER.

A fine table berry, and valuable for the home garden; a good market berry, but rather soft for distant shipment.

ORIGIN: by J. B. Turner, Jacksonville, Illinois.

PLANT: very hardy; fairly vigorous, making a good strong cane; productive.

BERRY: form roundish conical; size medium; color dark red; texture soft; flavor sweet, excellent.

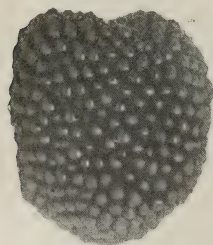
QUALITY: dessert or cooking very good.

VALUE: home market first class; distant market second class.

SEASON: medium.

## STRAWBERRY-RASPBERRY.

Considered somewhat valuable for canning, presenting an attractive appearance in the jar; interesting as a curiosity, but of no commercial value; may become a troublesome weed.



PLANT: easily propagated by suckers and rootstocks; scantily productive; stalks grow eighteen inches high and die down in the fall; fruits on growth of the current season.

BERRY: large; color a beautiful bright red; quality poor, but somewhat improved by cooking.

VALUE: market third class.

SEASON: July to September.

STRAWBERRY-RASPBERRY.

## 4. The Strawberry.

The strawberry is the most popular fruit cultivated in Ontario. This is doubtless due in part to the intrinsic value of the strawberry itself, which is one of the most delicious of fruits, but it is believed that the popularity of the strawberry comes largely from the fact that it can be grown by almost every one, as, unlike most fruits, very little land is required to produce sufficient for home consumption.

Strawberries can be grown in all parts of Ontario where the soil is suitable, hence large quantities are produced and consumed annually, and owing to the difference in the time of ripening between the southern and northern parts of the Province, the season is lengthened very much, and furthermore, the strawberries of one district do not come in such close competition with those from another as they would do if all ripened at the same time.

Strawberries will succeed on almost any rich well drained soil, but the largest crops are, it is believed, produced on a friable clay loam which is retentive of moisture. It is important, however, to avoid planting strawberries where water is likely to lie at any time, as surface water is very injurious to strawberries, and if water freezes over strawberries in winter they are almost sure to be killed.

In preparing soil for this fruit, it should be made very rich. There are no records known where land was made too rich for strawberries. There is nothing so good as well rotted manure for this purpose. Fresh manure is not so good, as it usually contains many weed seeds which will germinate after the manure is applied. The manure should be thoroughly worked into the surface soil early in the spring, for if this is not well done the soil will dry out, the conservation of moisture being important in growing strawberries. Strawberries also do well after clover, which in part takes the place of manure. The best time to set out the plants is early in the spring. Fall planting is not recommended, as although there is fair success in wet seasons, in a dry year the plants usually suffer.

When the ground has been marked off into rows about  $3\frac{1}{2}$  feet apart with cross rows about 18 to 20 inches apart, the plants are set at the intersections of the rows. The usual practice with large growers is for one person to open a hole with a spade, and another, preferably a boy, to place the plant, the soil being then pressed against the plant with the foot. In smaller plantations, planting with a trowel will be found very satisfactory. The chief essentials in planting are first to have the crown of the plant a little below the surface of the soil when it is pressed down. If the crown comes above the surface of the soil the plant is almost sure to die from drying out, and if set too deep the plant is liable to rot. The second important point is to make the soil firm about the plant, thus causing the moisture to rise to the roots. Strawberry plants are almost sure to die, especially in a dry time, if this precaution is not taken. A third essential, is to spread the roots in the cleft made by the spade, as although the plants will live even if this is not done, they will start quicker and thrive better if the roots are properly spread. After the plants are set cultivation should be thorough to conserve moisture and encourage the production of young plants early in the season, as the earlier these young plants are produced and become rooted, the larger crop they are likely to bear the next season.

All flowers should be pinched off the first season, as they exhaust the strength of the plant and delay the production of runners. The most common method of growing strawberries is in the matted row. Grown in this way there should be a row of plants about two feet in width by autumn. During the summer, as



runners are made, they should be placed about six inches apart and held with a little soil so as to give the plants the best chance to develop. After a row of the required width has been formed, later plants should, if possible, be cut out by hand and with the cultivator, so that the rows will not become too crowded nor too wide. A full crop should be obtained the second season. Hill culture and narrow rows are recommended in some quarters, but while finer fruit is obtained than by the matted row system, more labor is involved.

It is advisable to cover the strawberries lightly with straw after the ground freezes, to prevent the alternate thawing and freezing of the ground in winter and early spring. This covering should be removed in the spring before growth begins.

To get the best results only one crop should be taken from a strawberry plantation. If the land is very clean and the varieties used do not run much, two crops can be removed with profit. As a rule, however, the labor involved in destroying weeds, and the deterioration in size of fruit, makes it more profitable to plough up the plantation after the first crop.

It should be thoroughly understood by those intending to plant strawberries that some varieties have imperfect flowers and will not produce fruit unless a perfect flowering sort is planted near to pollinize the imperfect flowers. One row of the perfect variety to three of an imperfect is usually sufficient. There are many new varieties of strawberries introduced every year, but few of these are better or even as good as those already on the market. However, the old kinds are constantly giving place to the new, and it is wise for the fruit grower to learn which new varieties are giving the best results. Many varieties are described in this report, but it will be found that but few are recommended.

#### VARIETIES RECOMMENDED.

*Commercial:* Splendid (Perfect), Bederwood (P.), Warfield (Imperfect), not suited to light, sandy soil, Greenville (Imp.), Williams (P.), Saunders (P.), Sample (Imp.), Irene (Imp.), Buster (Imp.).

*Domestic:* Van Deman (P.), Splendid (P.), Excelsior (P.), Dunlap (P.), Ruby (P.), Bubach (Imp.), Irene (Imp.), Belt (P.), Lovett (P.).

**NOTE.**—In selecting varieties for planting, perfect-flowered varieties should be included to fertilize those having imperfect flowers.

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## DESCRIPTION OF VARIETIES

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### ANNIE LAURIE.

This is a very late variety, also one of the best quality. It may be taken as a standard for quality and flavor.

**ORIGIN:** a seedling grown by John F. Beaver, of Ohio, in 1889.

**PLANT:** very healthy and a good grower, making plenty of runners for a fruiting row. No rust; perfect blossom; moderately productive.

**FRUIT:** berries are large and round, like the Jersey Queen, with gold seeds prominent. A very bright glossy scarlet, making a fine appearance.

**FLESH:** pinkish white, of the very finest quality; a fine table variety.

**SEASON:** late.

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BEDERWOOD.

One of the most productive of the early varieties.

ORIGIN: with Bederwood, of Illinois.

PLANT: vigorous; inclined to rust; very productive. Stevenson ranks it "as the standard of productiveness for early varieties," blossom perfect, an excellent pollinizer.

BERRY: size small; form roundish; color light vermillion.

FLESH: texture soft; flavor sweet, ordinary.

QUALITY: dessert poor; canning fair.

VALUE: near market first class; distant second class.

SEASON: early.

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BELT.

ORIGIN: this berry comes from Ohio, having been originated by Wm. Belt, of that State. It is being grown largely as a fancy berry.

PLANT: large and strong, but rusts sometimes very badly; perfect blossom; quite productive.



BELT.

FRUIT: large to very large, conical; bright scarlet in color; firm.

FLESH: pink slashed with white; nice mild flavor; best quality.

SEASON: medium to late.

---

BRANDYWINE.

Highly valued in some sections.

ORIGIN: seedling of Glendale x Cumberland, raised by E. Ingram of Pennsylvania; introduced in 1894.

PLANT: very vigorous; propagates almost too freely; perfect flowered; productive.

BERRY: large; form oblate conical; color crimson.

FLESH: texture firm; flavor agreeable acid.

QUALITY: dessert very good.

VALUE: market first class.

SEASON: medium to late.



## BISMARCK.

A good mid-season market berry; in some respects an improvement on its parent. ORIGIN: grown from seed of Bubach fertilized by Bubach, by I. C. Bauer, of Arkansas.

PLANT: vigorous; healthy; easily propagated; perfect flower; very productive.

BERRY: large; roundish conical; color crimson; seeds yellow.

FLESH: color pinkish; texture firm; flavor sweet.

QUALITY: dessert very good.

VALUE: market first class.

SEASON: mid-season to late.

## BOYNTON.

This variety so closely resembles the old Crescent in its best days that it has been affirmed by some that it is the Crescent under a new name.

ORIGIN: said to be a cross between the Crescent and Sharpless; from Albany, N. Y.

PLANT: strong, vigorous, and healthy grower, making a wild, matted row; imperfect blossom; very productive.

FRUIT: medium in size; light scarlet in color; medium in firmness.

FLESH: pink; acid, but fair quality.

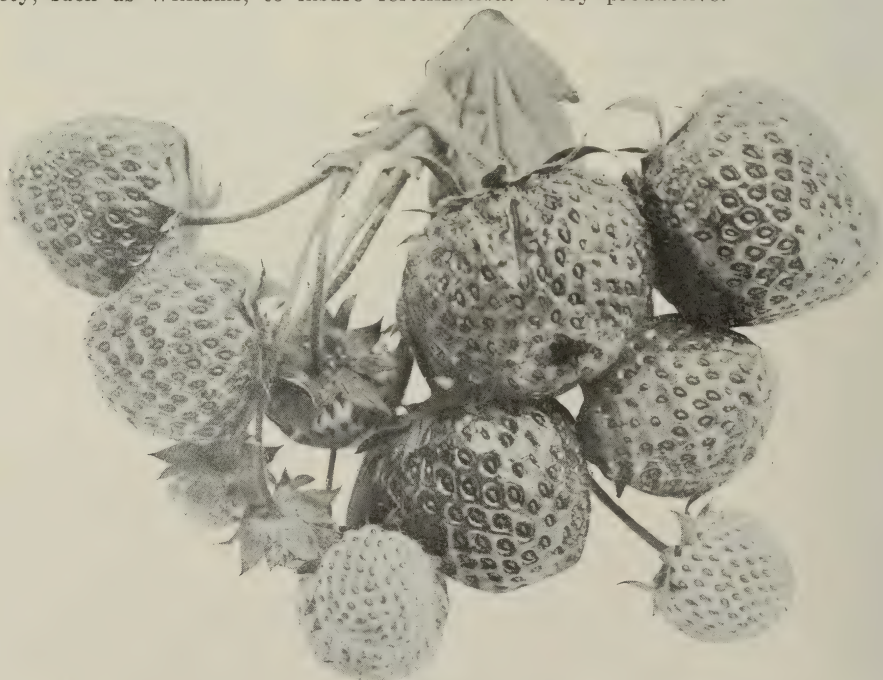
SEASON: early, medium.

## BUSTER.

A valuable late variety, which seems to adapt itself well to varied conditions. In the extensive variety tests both at the Central Experimental Farm, Ottawa, and at the Ontario Agricultural College, Guelph, it has for years ranked among the most productive sorts.

ORIGIN: supposed to be seedling of Bubach, raised by Mr. Stone, of Illinois.

PLANT: extra large, with very long stout leaf stalks and healthy foliage, remarkably free of rust; propagates readily and usually makes a good wide row of plants. Blooms late and flowers are imperfect, requiring a late blooming perfect flowered variety, such as Williams, to insure fertilization. Very productive.



BUSTER.

FRUIT: very large and well formed, quite regular in shape. Like Clyde, it is rather pale in color for a first-class berry. This is its most objectionable feature. Seeds deeply pitted. Moderately firm for so large a berry; fair quality, somewhat acid.

SEASON: among the latest.

ADAPTATION: seems to adapt itself well to varied conditions and is favorably reported upon from many sources. (Hutt).

## BUBACH.



BUBACH.

A standard market berry, of the largest size.  
 ORIGIN: a seedling raised by J. G. Bubach of Illinois.

PLANT: healthy; vigorous; does not make many runners; imperfect blossom; only fairly productive.

BERRY: very large; conical; irregular; color scarlet; showy.

FLESH: red; agreeable and acid.

QUALITY: dessert good.

VALUE: near market first class; one of the best.

SEASON: medium.

## CARRIE.

The Carrie would appear to have a bright future before it. It is one of the late sorts bidding for public favor.



CARRIE.

ORIGIN: seedling of Haverland, by Mr. Thompson, of Virginia.

PLANT: large, vigorous and healthy, making long and strong runners and plenty of them; it somewhat resembles Haverland; not so productive; imperfect blossom.

FRUIT: the fruit is not so long as Haverland; very firm; color bright scarlet, with gold seeds.

FLESH: white and solid; good flavor.

SEASON: medium.

## CLYDE.

At one time a universal favorite as a commercial berry, but has not held up its early records.

ORIGIN: seedling of Cyclone about 1890, by Dr. Stayman of Kansas; the Cyclone itself being a seedling of Crescent.

PLANT: very healthy, but wilts down under a hot sun; easy of propagation; perfect flowered.

BERRY: very large; form roundish conical; color light scarlet.

FLESH: moderately firm; color pinkish white; flavor very pleasant.

QUALITY: dessert very good; canning poor.

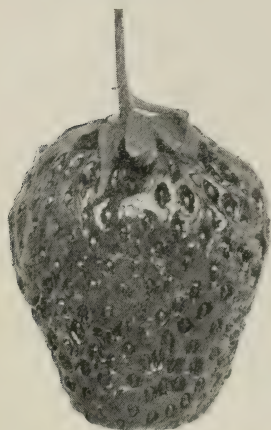
VALUE: second class for near market.

SEASON: early to medium.



### DUNLAP. (*Senator Dunlap*).

A fine mid-season market berry, said to be better in quality and a better shipper than its parent.



DUNLAP.

ORIGIN: Ohio; a seedling of Warfield.

PLANT: small; vigorous, resistant of drouth; very productive; blossoms perfect.

BERRY: size medium to large; form long conical with short neck; color dark crimson.

FLESH: color red; texture firm.

QUALITY: very good.

VALUE: market first class.

### ELEANOR.

The Eleanor is one of the extra early kind; a good healthy vigorous grower; fruit good size, fine shape; in wet seasons it has a kind of mildew like on the Michel's.

ORIGIN: New Jersey, a chance seedling found by Mr. Coombe.

PLANT: very healthy, vigorous grower, small and slender, dark in color, making many runners; perfect blossom; quite productive.

FRUIT: color dark scarlet or crimson; medium in firmness.

FLESH: red, white centre; acid, but good flavor.

SEASON: one of the earliest.

### EMPEROR

ORIGIN: by John Little, Granton, Ont.

PLANT: large, vigorous, healthy; quite productive; perfect flowered.

BERRY: very large; conical, sometimes ribbed; color dark red.

FLESH: reddish pink almost to the centre; texture firm.

QUALITY: good.

SEASON: medium to late.

### EMPRESS.

Very like the Emperor and from the same source, originated by the late John Little; both resemble the Woolverton in fruit. The plant is very healthy, strong, productive and a vigorous grower. The fruit is dark red and attractive, and of good quality; season, medium to late; blossom perfect.

### EXCELSIOR.

Popular in some sections because very early.

ORIGIN: Arkansas.

PLANT: vigorous; propagates easily; sometimes inclined to leaf rust; fairly productive; blossom perfect.

BERRY: medium; form roundish, somewhat conical; color bright red.

FLESH: texture firm; flavor very pleasant.

QUALITY: very good.

VALUE: market second class.

SEASON: very early.

## GEISLER.

ORIGIN: a chance seedling found in Michigan, somewhat resembling the Seaford in shape and size.

PLANT: a very strong plant, making plenty of runners; very healthy, no sign of rust and quite productive; perfect blossom; a very early bloomer, one of the first.

FRUIT: large, bright dark scarlet, round to oblong in shape; solid.

FLESH: light pink in color, medium in firmness and of good quality.

SEASON: early to medium.

## GANDY.

One of the best very late varieties.

ORIGIN: New Jersey; seedling of Jersey Queen x Glendale

PLANT: healthy; blossoms perfect; a shy bearer.

BERRY: large; form conical, regular; color glossy crimson.

FLESH: color pink; texture firm.

QUALITY: dessert very good; canning excellent.

VALUE: market near or distant first class; an excellent shipping berry.

SEASON: very late.

## GLEN MARY.

Considerably planted for market purposes on account of its size and productiveness.

ORIGIN: a chance seedling found by J. A. Ingram, of Pennsylvania.

PLANT: vigorous; healthy; foliage dark green; propagates readily; blossoms perfect; fruit stem stout; productive.

BERRY: large to very large; form round conical, ribbed, with green tip; color dark crimson.

FLESH: pink and white; texture firm; flavor slightly acid.

QUALITY: dessert fair; canning good.

VALUE: market first class; a good shipper.

SEASON: medium to late.

## GREENVILLE.

A good commercial berry, which seems to succeed everywhere.



GREENVILLE.

ORIGIN: a chance seedling of Bubach found in Ohio.

PLANT: vigorous; healthy; propagation easy; blossoms imperfect; very productive.

BERRY: large but not quite as large as Bubach; form obtuse conical, approaching heart shape; color scarlet.

FLESH: pink to white; somewhat hollow; texture moderately firm; flavor pleasant.

QUALITY: very good.

VALUE: first class, especially for near market.

SEASON: medium.

## HALES 11.59 P. M. (Midnight).

ORIGIN: seed from Haverland crossed with Parker-Earle; introduced by J. H. Hale, of Connecticut.

PLANT: strong and healthy, does not resemble either parent; makes plants only sparingly, but makes a good fruiting row; the runners are strong, fairly productive, and very late; blossom, perfect.

FRUIT: the berry is medium in size, flat and conical; color, light, almost white on under side; texture firm; flavor fine.

FLESH: pinkish, meaty, good eating.



## HAVERLAND.

A good market variety, which succeeds everywhere; widely grown; the berries are a little soft for shipment.

ORIGIN: with a Mr. Haverland, of Ohio.

PLANT: very vigorous; very healthy; foliage light in color; fruit stalk long and not always able to support the load of fruit; blossoms imperfect; very productive.

BERRY: size large; form long, conical; color bright scarlet.

FLESH: pinkish; texture soft; flavor sweet.

QUALITY: dessert fair; canning fair.

VALUE: near market first class; distant market second class.

SEASON: early.

## HOWARD'S No. 4.

A seedling originated by Mr. A. B. Howard, of Massachusetts.

PLANT: a strong, healthy good grower, very productive.

BERRY: large, conical, very regular; bright dark scarlet; large, and of great beauty.

QUALITY: very good.

SEASON: medium to late.

## IRENE.

A good late variety, well worthy of a place in any collection for home use or market. Has been under test at the Ontario Agricultural College, Guelph, for eight years, and ranks among the first half dozen for productiveness, and general market value. An excellent canning variety because of its rich, dark color.

PLANT: not large but very vigorous and healthy; makes plenty of runners; blooms late, and is imperfect flowered, requiring a late blooming pollenizer to insure good fertilization; very productive.

FRUIT: medium size; good shape; very smooth and regular; rich, dark crimson in color, with bright yellow seeds and varnished appearance; very attractive; firm, and good shipper; brisk acid; fairly good quality.

SEASON: medium to late, has a long season of fruiting.

ADAPTATION: adapts itself well to varied soils, and has been reported upon favorably by experimenters all over the Province to whom it has been sent for co-operative testing. Has not done so well at Ottawa as at Guelph. (Hutt).



IRENE.

## KLONDIKE.

A good late variety.

ORIGIN: Massachusetts.

PLANT: vigorous; somewhat subject to rust; easily propagated; quite productive.

BERRY: size large; form roundish conical, somewhat irregular; color scarlet; large yellow seeds.

FLESH: pink; moderately firm.

QUALITY: fair.

## LOVETT.

A popular main crop strawberry; by some growers preferred to either Williams or Saunders.

ORIGIN: Crescent x Wilson, by J. H. Norris of Kentucky.

PLANT: vigorous; foliage somewhat subject to rust; fruit stalks short and drooping; perfect flowered; productive.



## LOVETT.

BERRY: large; form round, conical; color dark red.

FLESH: color reddish; texture firm; flavor pleasant subacid.

QUALITY: dessert good; canning very good.

VALUE: near or distant market first class.

SEASON: medium.

LUTHER. (*August Luther*).

One of the extra early varieties; endures drouth well; succeeds generally.

PLANT: small; good grower; healthy; perfect in flower; fairly productive.

BERRY: medium; roundish conical, sometimes necked; color scarlet, with yellow seeds; texture moderately firm.

QUALITY: good.

VALUE: first class for early market.

SEASON: early; ripens with Michel.

## MARGARET.

ORIGIN: Ohio, from the seed of the Crawford, by Mr. Beaver.

PLANT: large and strong, sending out the largest runners of any sort; very healthy; perfect blossom; quite productive.

FRUIT: large, very regular, crimson in color; seeds golden, solid and firm.

FLESH: red; inclined to tartness, but of good quality.

SEASON: medium.



## MARSHALL.

This variety has perhaps received more favorable notice than most others of recent introduction. It is vigorous in growth, leaves very large and produces very large, beautiful, dark crimson berries of fine quality.



MARSHALL.

ORIGIN: a chance seedling found growing on a stone heap by Mr. Ewell, of Massachusetts.

PLANT: a vigorous grower, large leaves, somewhat tender both in foliage and blossom and subject to rust; medium in color, first growth being yellow; perfect blossom; fruit stem strong and able to bear up the immense berries; medium in productiveness.

FRUIT: of the largest size; dark crimson, firm and fine looking, quite regular in shape, *i. e.*, each berry is of same shape, but ribbed and tough; seed imbedded.

FLESH: red, with a dash of white in centre, solid, fine quality; one of the best for dessert.

SEASON: early to medium.

ADAPTATION: does its best only on good soils and under highest cultivation; a fine one for amateurs.

## MASTODON.

This is very like Bubach both in plant and in fruit, and quite as good.

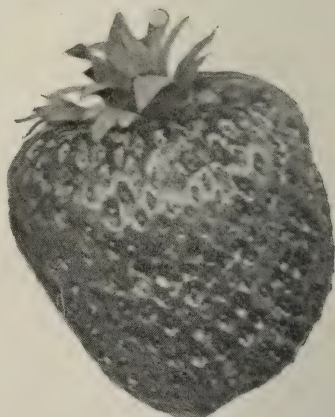
ORIGIN: introduced by James Lippincott, Jr. Mount Holly, N. J.

PLANT: strong, large dark foliage; very healthy; makes plants freely enough for a good fruiting row; imperfect blossom; fruit stalk is short, thick and strong.

FRUIT: very large; bright crimson and very showy.

FLESH: pink; medium as to firmness and good quality.

SEASON: medium.



MASTODON.

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MICHEL.

A favorite very early berry with some growers; a comparative failure with others; widely planted in Ontario.

ORIGIN: chance seedling of Crescent found by J. S. Michel, Judsonia, Arkansas.

PLANT: vigorous; propagation rapid; fairly productive on some soils, on others not productive; foliage light colored; perfect flowered.

BERRY: size small to medium; form round conical; color dull red, withered appearance.

FLESH: pinkish; texture tough; carries well.

QUALITY: good.

SEASON: extra early.

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## MONITOR.

The Monitor originated from a chance seed in the orchard of L. T. Russell, Missouri, on ground where formerly Crescent and Capt. Jack grew. It has some of the qualities of both parents, the productiveness of the Crescent and the vigorous foliage of Capt. Jack.

PLANT: vigorous and healthy; foliage very dark green, glossy. The plant is small and makes almost too many runners; stands dry weather well and is very productive; blossom perfect.

FRUIT: the berry is large, roundish in form, and bright scarlet. The vigor of the plant seems to be such that it is able to mature and ripen its immense crop, there being no small berries.

FLESH: firm and good flavor; pinkish inside.

SEASON: early to late.

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## NETTIE.

ORIGIN: one of Black's pedigree seedlings; it is a strong competitor of Hunn for extreme lateness.

PLANT: of medium size; quite healthy and a good runner, making plants freely; fairly productive; blossom imperfect.

FRUIT: large, ribbed, rough, of quite light color; seeds dark; flavor sour, but good; texture fairly firm.

FLESH: light colored, almost white.

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## NICK OHMER.

A good medium to late variety of excellent quality.

ORIGIN: seedling raised by John F. Beaver, of Ohio.

PLANT: vigorous, stocky; propagation easy; healthy; foliage dark; perfect flowered.

BERRY: large, with some small ones; form roundish conical, smooth and regular; color glossy red with yellow seeds.

FLESH: pinkish toward outside and white at centre; texture very firm; flavor very pleasant.

QUALITY: very good.

VALUE: first to second class.

SEASON: medium to late.

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## ROBBIE.

ORIGIN: One of J. H. Black's pedigree seedlings, from New Jersey.

PLANT: good grower, perhaps not as large as the Nettie or Joe, but healthy and free from disease; fairly productive; blossom perfect.

FRUIT: good size; conical in shape; light red; good flavor; quite pleasant, though peculiar to the taste.

FLESH: salmon colored.

SEASON: late.



### RIDGEWAY.

The Ridgeway is a good medium to late berry. It somewhat resembles the old Cumberland, but is darker.

ORIGIN: a seedling of Jersey Queen and Parker Earle, by Mr. Ridgeway, of Indiana.

PLANT: strong and healthy, stools out, would be a good one for hills or narrow rows; foliage free from rust; blossom perfect and large; quite productive.

BERRY: medium to large; highest scarlet color; prominent golden seeds, fine looking; medium in firmness.

FLESH: red, solid and very good quality; fine flavored.

SEASON: medium to late.

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### RUBY.

A good standard variety, which adapts itself well to various soils and localities. Has been under test at the Ontario Agricultural College, Guelph, for nine years and ranks first among nearly three hundred varieties tested for that number of years.



RUBY.

ORIGIN: a chance seedling with Mr. Riehl, of Illinois.

PLANT: a strong, vigorous grower, makes plenty of runners; blooms about midseason; is perfect flowered and a good pollinizer; very productive.

BERRY: large, regular in shape; a good dark crimson color; firm, and of good quality.

SEASON: midseason.

ADAPTATION: does well at Guelph, and is favorably reported upon from other sections. (*Hutt*).

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### SAMPLE.

A profitable late market berry.



SAMPLE.

ORIGIN: Massachusetts.

PLANT: vigorous; healthy; productive; flowers imperfect.

BERRY: size large; form roundish conical; color crimson.

FLESH: tinted; texture fairly firm, juicy.

QUALITY: fair.

VALUE: market first class.

SEASON: very late.

## SAUNDERS.

A first class sort for medium to late market.



SAUNDERS.

ORIGIN: a seedling raised by John Little, Granton, Ont., and named by him in honor of Dr. Wm. Saunders, of Ottawa.

PLANT: healthy, very little rust; very vigorous; very productive; blossom perfect; blooms late and so escapes the spring frosts; propagates easily.

BERRY: size large; form roundish conical; color glossy crimson.

FLESH: red; texture firm; flavor very pleasant.

QUALITY: dessert or cooking very good.

VALUE: near or distant market first class.

SEASON: medium to late.

## SEAFORD.

The Seaford is a good, medium season berry.

ORIGIN: a chance seedling, introduced by Slaymaker & Son, of Dover, Del.

PLANT: a strong, vigorous grower and healthy, producing large clusters of fine fruit; makes many plants; perfect blossom; very productive.

BERRY: large and fine looking; bright crimson with gold seeds imbedded; very solid and firm.

FLESH: scarlet in color; very firm and of very good quality.

SEASON: early to medium.

## SHARPLESS.

The Sharpless has been before the public for a long time. In some parts it is still said to be one of the best, but in other places it is not productive enough to make it profitable for market.

ORIGIN: Pennsylvania.

PLANT: a strong, vigorous grower, large and healthy; no rust; perfect blossom; quite productive on some soils.

FRUIT: very large; light scarlet in color; glossy, gold seeds prominent, does not color well.

FLESH: white to pink; firm and very best quality; fine for the table.

SEASON: medium.

## SMITH.

Very popular for canning, having the agreeable acid and firm flesh of its parent.

ORIGIN: a seedling of that old favorite, the Wilson's Albany, raised by L. Smith, of Wisconsin.

PLANT: healthy; most vigorous; blossom perfect; very productive.

BERRY: medium to large; roundish conical; irregular; color scarlet.

FLESH: texture firm; quite acid; agreeable.

QUALITY: canning or preserving, best.

VALUE: market first class.

SEASON: early.



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 SPLENDID.

A first class early to mid-season market berry.



SPLENDID.

ORIGIN: by C. H. Sumner, Illinois.

PLANT: very healthy; a good strong grower; productive; blossom perfect, a good pollinizer.

BERRY: medium to large; form roundish; color dark crimson.

FLESH: firm; flavor good.

QUALITY: dessert very good.

VALUE: market first class.

SEASON: early to medium.

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 STAPLES.

ORIGIN: from seed of the Warfield by the late Mr. Staples of Ohio.

PLANT: quite healthy, making plenty of runners for a wide row, if needed; quite vigorous in growth; perfect blossom; a good early bloomer to fertilize early pistillates with.

BERRY: dark crimson in color, firm and good flavor; color very like Warfield; size medium to large for so early a berry.

FLESH: pink and solid; good flavor, somewhat acid, yet spicy.

SEASON: extra early.

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 TENNESSEE. (*Tennessee Prolific*).

A very fine market berry, which has become popular wherever grown.

ORIGIN: Crescent x Sharpless, raised by Captain Hodges, of East Tennessee.

PLANT: healthy; vigorous; very productive; easily propagated; blossom perfect; blooms early.

BERRY: large; form round conical, sometimes double at the point; color bright crimson.

FLESH: color red; texture firm; flavor agreeable.

QUALITY: good.

VALUE: first class for near or distant market.

SEASON: medium.

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 TIMBRELL.

A fairly good late variety.

ORIGIN: chance seedling found by H. S. Timbrell of New York State.

PLANT: healthy; vigorous; blossoms perfect; not very productive.

BERRY: size medium to large; form roundish conical; color crimson, but does not color well.

FLESH: texture very firm; flavor agreeable.

QUALITY: dessert best.

VALUE: market second class.

SEASON: late.

## VAN DEMAN.

One of the earliest; a favorite with some growers, but not a success everywhere.



VAN DEMAN.

ORIGIN: Crescent x Captain Jack; raised by J. C. Bauer, of Judsonia, Arkansas.

PLANT: vigorous; productive; rusting slightly on some soils; foliage dark; fruit stalk strong enough to support the fruit; blossoms perfect.

BERRY: medium; form round conical; color dark crimson; seeds yellow, with a varnished appearance; ripens and colors all over at the same time.

FLESH: color pink; texture firm, a good shipper; flavor good.

QUALITY: dessert very good.

VALUE: first class for market because of its season.

SEASON: very early.

## WARFIELD

This variety holds first place for productiveness among 350 varieties which have been under test at the Ontario Agricultural College for the past ten years. With the housekeeper it is a favorite canning variety because of its dark rich color. It is one of the most desirable varieties for general cultivation, where the soil is not too light and dry for its growth.



WARFIELD.

ORIGIN: a chance seedling, supposed to be a cross between Crescent and Wilson, found by B. C. Warfield of Southern Illinois.

PLANT: small, but a rampant grower, and often makes too many runners, filling the rows too thickly. Succeeds best on moist soils, and in showery seasons; often proves a failure on very dry soils or in times of drouth. Blossoms early and requires an early blooming bisexual variety, such as Splendid or Van Deman, to fertilize its blossoms; very productive.

BERRY: medium size, very regular in shape, dark rich crimson color; firm, good shipper, and excellent for canning; somewhat acid, but good quality.

SEASON: early to midseason, holds out well if season is favorable.

ADAPTATION: does well wherever the soil is not too light and dry. (Hutt).



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WILLIAMS.

Widely grown in Ontario in place of the old favorite Wilson; preferred by some growers to all others.



WILLIAMS.

ORIGIN: a seedling of Sharpless, raised by Mr. Williams of Burford, Ontario.

PLANT: vigorous; somewhat inclined to rust, runners abundant, short; blossom perfect; very productive.

BERRY: large, form roundish conical; seeds sunken; color crimson, usually with a white tip.

FLESH: red; often hollow; texture firm.

QUALITY: fair.

VALUE: market first class.

SEASON: medium to late.

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WOOLVERTON.

ORIGIN: a seedling raised by John Little, of Granton, near London, Ontario, and named by him in honor of Linus Woolverton, Grimsby.

PLANT: a strong, healthy grower; withstands drouth well; deep rooted; foliage dark colored; runners numerous; blossoms perfect; moderately productive.

BERRY: very large; form broad conical, often wedge shaped; color crimson with crimson seeds; showy.

FLESH: red; texture firm; flavor mild acid.

QUALITY: good.

VALUE: first class for home use or market.

SEASON: late.

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# Appendix.

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## SPRAYING.

Spraying is absolutely necessary nowadays to ensure good fruit every year. There are so many injurious insects and fungous diseases which attack the trees and fruit that it is very rarely a tree, if unsprayed, will escape being affected by something which will lessen the crop of No. 1 fruit.

Spraying is not sprinkling, and in order to get good results it is necessary to apply the mixtures and solutions in as fine a spray as possible. A mist-like spray that will float through the air and envelop the tree and fruit is what is required. A coarse spray will run off the foliage and often will accumulate at the tips of the leaves and cause injury rather than benefit the tree. Thoroughness is just as essential in spraying as in anything else. In spraying for most fungous diseases the object is, to cover all of the surface of the leaf and fruit with the mixture so that when a spore comes in contact with it, it will be destroyed. The more of the surface that is left uncovered the more spores will germinate, and as they are usually present in millions the necessity of thorough spraying should be apparent. In spraying to control biting insects, thoroughness is just as essential, for unless the poison is well distributed many of the insects will not be destroyed and much injury will be done. In fighting insects, such as the San José Scale, the Aphis, and the Oyster Shell Bark Louse, which are killed by contact poisons, thoroughness is even more necessary, as these multiply so rapidly that a few insects which escape may soon reinfest the whole tree.

Spraying should be timely. Very often through ignorance of the habits of the insect or disease, spraying is delayed until after the season is passed when it could be controlled; hence time and money are often thrown away and the lack of success in spraying is blamed on the ineffectiveness of the mixture rather than the lack of knowledge of the man who sprayed. It is true that every man cannot learn the life history of all injurious insects and diseases, nor is this really necessary, but the average orchardist should know more about them than he does.

Every fruit grower should have a spray pump of some kind. The amateur may be content with a small hand pump which will suit his purposes quite well, but the commercial grower should have a barrel pump or one of the power sprayers which are now on the market, and which permit of obtaining that mistlike spray already referred to. Labor is expensive and hard to get on the average farm, hence a sprayer should be purchased which will economize time and labor as much as possible.

The following spray calendar will, it is believed, give nearly all the information which the average fruit grower requires. Descriptions of insects and fungous diseases are not given in this work, as they are dealt with at length in special publications.

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## DIRECTIONS FOR TREATMENT OF INSECT PESTS AND PLANT DISEASES.

### FORMULÆ.

#### I. BORDEAUX MIXTURE (For Fungous Diseases).

Copper sulphate (Bluestone) .....	4 pounds.
Quick lime (fresh) .....	4-6 "
Water .....	40 gallons.

In making this mixture, observe the following precautions and directions:

1. *Use nothing but fresh quick-lime.* Owing to variability in the qualities of lime as found in different parts of the Province, it is safer for the average fruit grower to use the larger quantity named above, viz., 6 pounds. The lime should be slowly slaked by the gradual addition of water.

For convenience, stock solutions of milk of lime and bluestone should be prepared and kept in different barrels in readiness for spraying operations. In barrel No. 1, 25 pounds of fresh lime are gradually slaked, and barrel made up to 25 gallons of water; in barrel No. 2, 25 pounds of copper sulphate, or bluestone, are dissolved in 25 gallons of water. For rapid dissolving use warm water. These are the stock solutions. Each gallon of milk of lime contains one pound of lime, and each gallon of bluestone solution contains one pound of bluestone. When we wish to make up a barrel of Bordeaux mixture, we take out 4 gallons of milk of lime, if using the 4-pound formula, or 6 pounds if using the 6-pound formula, and 4 gallons of bluestone solution, and either dilute each in separate barrels in about 20 gallons of water before mixing in the barrel attached to the spray-pump, or else pour each separately into the barrel in which are already 30 to 32 gallons of water, according to formula used. The first method is the preferable one.

2. *Never mix the concentrated stock solutions together.* If the milk of lime and bluestone are mixed in the concentrated form, just as they are taken from the stock solution, a precipitate of a flakey nature will soon settle out, and either fall to the bottom or clog the nozzle.

3. *Test the Bordeaux to find out whether sufficient milk of lime has been added.* This is most easily done by means of the ferrocyanide test. A saturated solution of this substance can be purchased at any druggist's for a few cents. In testing, place some of the Bordeaux, which has been thoroughly stirred, into a saucer, and add a few drops of the ferrocyanide. If sufficient lime has been used, no discoloration will appear, but if insufficient, a deep dark brown color will be produced.

4. *Always strain the milk of lime to prevent gritty particles from clogging the nozzles.*

5. *Use a fine nozzle; do not soak or drench the tree.*

6. *The stock solutions will keep, but the Bordeaux mixtures becomes useless after standing for a day or two.*

#### 2. THE COMBINATION BORDEAUX AND PARIS GREEN MIXTURE. (For Fungous Diseases and Leaf-eating Insects.)

This mixture is prepared like the Bordeaux, but 4 to 6 ounces of Paris green are added and thoroughly stirred before spraying.

Copper sulphate (Bluestone) .....	4 pounds.
Quick lime (fresh) .....	4-6 "
Paris green.....	4-6 ounces.
Water (1 barrel) .....	40 gallons.

In small quantities it may be made as follows :

Bluestone .....	4 level tablespoonfuls.
Quick lime .....	4-6                   “
Paris green .....	1                   “
Water .....	1 pail (2 gallons).

### 3. AMMONIACAL COPPER CARBONATE SOLUTION.

Copper carbonate .....	1 ounce.
Strong ammonia sufficient to dissolve the copper carbonate, usually more than .....	$\frac{1}{2}$ pint.
Water .....	10 gallons.

This solution is not much used, and is recommended only in cases where the fruit is so far advanced that it would be disfigured by using the Bordeaux mixture.

### 4. POTASSIUM SULPHIDE (Liver of Sulphur). (Used to control Gooseberry Mildew.)

Dissolve 4 ounces in 8 gallons of water.

### 5. PARIS GREEN MIXTURE. (Liquid.) (For Leaf-eating Insects.)

Paris green .....	1 pound.
Water .....	150 gallons.
Quick lime .....	2 pounds freshly slacked.

Or,

Paris green .....	1 teaspoonful (level).
Water .....	1 pail (2 gallons).
Quick lime .....	1 teaspoonful (level).

### *Paris Green Mixture. (Dry.)*

Paris green .....	1 pound.
Flour or dust .....	100 pounds.

### 7. HELLEBORE.

White hellebore (fresh) .....	1 ounce.
Water .....	2 gallons.

### 8. PYRETHRUM, or Insect Powder.

Pyrethrum powder (fresh) .....	1 ounce.
Water .....	3 gallons.

Or,

Pyrethrum powder .....	1 ounce.
Flour (cheap) .....	5 ounces.

Mix thoroughly, allow to stand over night in a closed box, then dust on plants through cheese-cloth.



## 9. KEROSENE EMULSION (for Bark-lice and Plant Lice).

Hard soap .....	$\frac{1}{2}$ pound, or soft soap	1 quart.
Boiling water (soft) .....		1 gallon.
Coal oil .....		2 gallons.

After dissolving the soap in water, add the coal oil and stir well for 5 or 10 minutes. When properly mixed, it will adhere to glass without oiliness. A syringe or pump will aid much in this work. In using, dilute with from 9 to 15 parts of water. Kerosene emulsion may be prepared with sour milk (1 gallon) and coal oil (2 gallons), no soap being required. This will not keep long.

## 10. TOBACCO DECOCTION.

Refuse tobacco .....	2 pounds.
Water .....	5 gallons.

Boil the mixture for 30 minutes or more, until a dark brown tea-colored solution is obtained. Keep it covered until cool. It may then be used undiluted for spraying infested plants.

## 11. WHALE OIL SOAP.

*For Plant Lice.* 1 pound in 7 gallons hot water.

*For San José Scale in winter.* 2 pounds in 1 gallon hot water applied as the buds are swelling.

## 12. LIME SULPHUR MIXTURE.

Quick lime .....	20 pounds.
Flowers of sulphur .....	15-20 "
Water .....	1 barrel.

To prepare, have 12-14 gallons of boiling water in the barrel or kettle, throw in the lime and add the sulphur, which should preferably have been mixed previously into a paste with hot water. The whole mixture should then be boiled until the characteristic green color is obtained. The time required varies with the kind of lime used and may take from  $\frac{3}{4}$  to  $1\frac{1}{2}$  or 2 hours. Dilute with hot water to fill up the barrel and spray while warm.

## 13. WASH FOR BORERS.

First, add soft soap to a saturated solution of washing soda to make a thick paint, then add 1 pint crude carbolic acid, and  $\frac{1}{2}$  pound Paris green to 10 gallons of wash.

To be applied to the trunks of apple trees in early June.

## 14. LIME WASH.

(For Oyster-shell Bark Lice, etc.)

Slake  $1\frac{1}{2}$  pounds fresh lime in 1 gallon of water. Strain the wash before spraying. To be applied during winter to trees infested with oyster-shell bark lice.

## TREATMENT.

## APPLE AND PEAR.

## A. Against Leaf-eating Insects and Fungous Diseases.

Treatment.	When to spray.	Insect pests and diseases controlled.
1. Paris Green in water. (Formula 5.) (Important.)	Just as leaf-buds are expanding.	Bud-moth, case-bearers.
2. Bordeaux mixture and Paris green. (Formula 2.)	About a week later.....	Bud-moth, case-bearers, canker-worms, tent-caterpillars. Scab, leaf-spot and mildew.
3. Bordeaux and Paris green. (Formula 2.) (Important.)	Just before blossoms open...	Canker-worms, tent-caterpillars, etc. Scab and leaf-spot, etc.
4. Bordeaux and Paris green. (Formula 2.) (Important.)	Just after blossoms fall .....	Codling-moth, canker-worms, tent-caterpillars, pear-slug. Scab and leaf-spot.
5. Bordeaux and Paris green. (Formula 2.)	Ten days or two weeks later	Codling-moth, Palmer worm, apple <i>Bucculatrix</i> . Scab and leaf-spot, etc.

*Codling-moths* cannot always be controlled by spraying, especially in the south-western section of Ontario, where a second brood appears later in the season.

In addition to spraying, in this district, use bandages around the trees. Make them from four to six inches wide, three or four inches thick, of any kind of cloth. Old bags, sacks, carpets, coarse material of any kind will do. Bands of straw and tow have been used with some success. During the first week in June bind one around each tree three or four feet from the ground; secure it either with cord or small nails; *take it off every twelve days*, and carefully examine for codling cocoons. These may be readily destroyed by crushing. Replace the bands as before.

*Tent-caterpillars* are controlled by burning the webs or nests in May; by collecting and destroying the clusters of eggs in fall and winter; by banding the trees; and by spraying the young caterpillars with Paris green.

*Canker-worms* may be largely controlled by banding the trees in autumn and early spring; and by spraying with Paris green when the worms appear.



**B. Against Sucking Insects, such as Plant-lice and Scale Insects, and against Pear Leaf Blister-mites.**

Treatment.	When to Spray.	Insects controlled.
1. Kerosene emulsion (Formula 9), (1 part in 10 parts water).	Before buds start in spring.	Pear-leaf blister-mite.
2. Kerosene emulsion solution (1 part emulsion to 10 parts water). Or whale-oil soap solution (Formula 11), (1 lb. to 7 gals. water).	As leaves are unfolding . . . .	Pear psylla and aphids.
3. Kerosene emulsion (Formula 9), whale-oil soap as before.	Ten days later. . . . .	Psylla and aphids.
4. Kerosene emulsion (Formula 9), or whale-oil soap as before. Or lime wash (No. 14).	About end of May or first of June. During winter. . . . .	Oyster-shell bark-lice.

**C. Treatment for destroying *Borers* :**

- (a) Dig out the borers whenever possible.  
(b) Apply the soap-soda wash (Formula 13) in early June.

**PLUM AND CHERRY.**

**A. Against *Curculio*, Brown Rot, Shot-hole Fungus, and Leaf-eating Insects.**

Treatment.	When to spray.	Insects and diseases controlled.
1. Bordeaux and paris green. (Formula 2.)	When leaf-buds are opening.	Brown rot, shot-hole fungus.
2. Bordeaux and paris green. (Formula 2.)	When fruit is formed. . . . .	<i>Curculio</i> , green fruit worms, brown rot, etc.
3. Bordeaux and paris green. (Formula 2.)	Two weeks later. . . . .	Brown rot, <i>curculio</i> , etc.
4. Ammonia-copper-carbonate solution. (Formula 3.)	When fruit is large. . . . .	Brown rot, etc.

The *Curculios* are most readily controlled by jarring the trees in early morning, and collecting them on a sheet spread under the tree. The jarring should be begun when the fruit has set, and continued for three weeks. Thrice a week is often enough to jar.

## B. Against Plant-lice and Scale Insects.

Treatment.	When to spray.	Insects controlled.
1. (Kerosene emulsion Formula 9), (1 part to 4 parts water.) Or whale-oil soap, (2 lbs. to 1 gal. hot water.)	In winter or early spring.	Plum scale, San José Scale, etc.
2. Kerosene emulsion (Formula 9), (1 part to 10 parts Water.) Or whale-oil soap solution (Formula 11), 1 lb. to 7 gals. water.) Or tobacco solution (Formula 10.)	As soon as lice appear on young leaves.	Plant-lice.

## PEACH.

## A. Against Peach-leaf Curl, Brown Rot, Curculio, Bud-moth.

Treatment.	When to spray.	Insects and diseases controlled.
1. Bordeaux and Paris green. (Formula 2.)	Before flower buds open	Bud-moth and peach leaf curl, brown rot.
2. Bordeaux and Paris green. (Formula 2.)	After blossoms fall.....	Peach-leaf curl, brown rot, bud-moth and curculio.
3. Bordeaux and Paris green. (Formula 2.)	Two weeks later.....	Brown rot, etc.
4. Ammonia-copper carbonate (Formula 3.)	When fruit is well-formed.	Brown rot, etc.

## B. Against Aphids, and Scale Insects.

1. Kerosene emulsion (Formula 9), (1 part in 10 parts.) Or whale-oil soap (Formula 11), (1 lb. in 7 gals. water.)	Whenever young lice appear.	Aphids.
2. Whale-oil soap, (2 lbs. in 1 gal. hot water.)	In early spring before buds open.	San José scale.

## C. Against Peach Tree Borer.

1. Prof. Slingerland recommends *gas tar* as a trunk wash. A trial experiment should be made first on a few trees to find out if it injures the trees, for gas tar varies in composition.



2. Dig out or probe the borers every fall and spring; and mound up a new base with earth for six inches; remove and examine in September.
3. Apply Formula in early June.

### GRAPE.

#### A. Against Black Rot, Mildews and Leaf-eating Insects.

Treatment.	When to spray.	Insects and diseases controlled.
1. Bordeaux and Paris green. Formula 2.) (Important.)	As buds begin to swell.	Flea-beetle, black rot, mildews.
2. Bordeaux and Paris green. (Formula 2.)	Ten days or two weeks later, before blossoms open.	Black rot, mildews and flea-beetles.
3. Bordeaux and Paris green. (Formula 2.)	Just after blossoming.	Black rot and mildews.
4. Bordeaux and Paris green. (Formula 2.)	Two weeks later.....	Flea-beetle and black rot.
5. Ammonia-copper carbonate. (Formula 3.)	When fruit is well formed.	Black rot and mildews.

#### B. Against Grape Thrip.

1. Kerosene emulsion, 1 part in 9 parts water.	Soon after leaves are formed.	Thrip or leaf-hopper.
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NOTE—Names printed in *Italics* are synonyms of varieties otherwise named.





THIRTY-SEVENTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY  
OF ONTARIO

1906

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(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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1907





*To the Honourable WILLIAM MORTIMER CLARK, K.C.,  
Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the pleasure to present herewith for the consideration of your Honour the Report of the Entomological Society for 1906.

Respectfully submitted,

NELSON MONTEITH,  
Minister of Agriculture.

Toronto 1907





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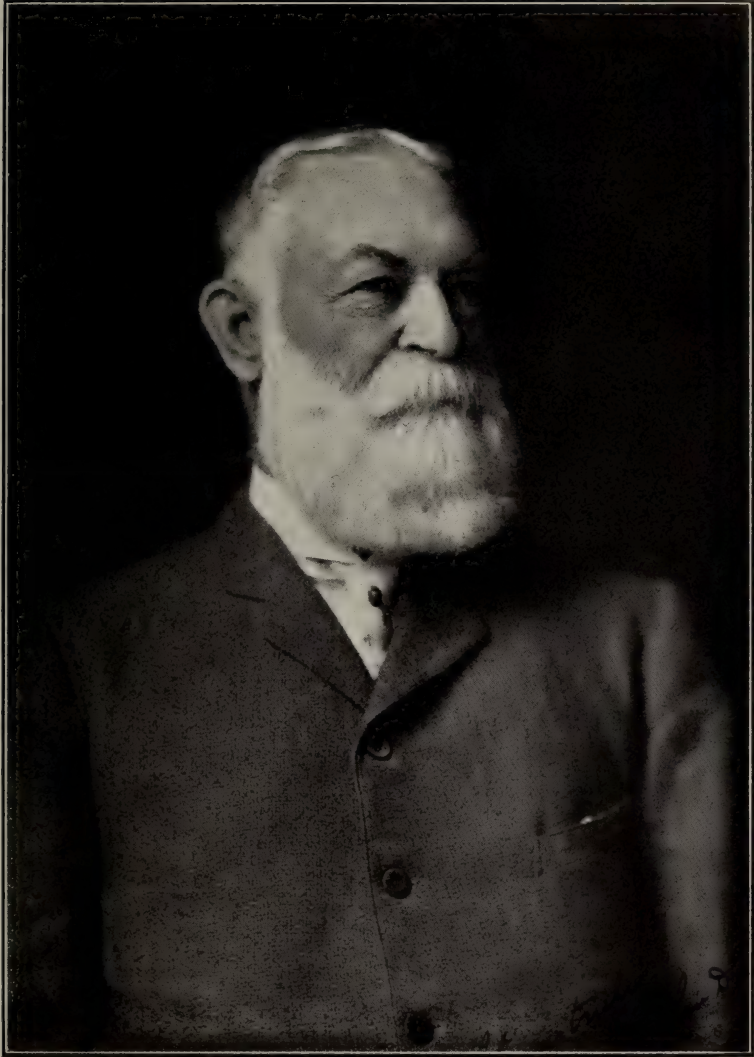
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 (Director of the Experi-  
   mental Farms of the  
   Dominion.



JOHN D. EVANS, C.E.  
President of the Entomological Society of Ontario, 1904-1906.







PLATE A.

- |   |   |
|---|---|
| 1. Vein Gall of White Ash. <i>Eriophyes</i> sp.   | 4. Manitoba Maple Wart Gall. <i>Eriophyes</i> sp. |
| 2. Chokecherry Mite Gall. <i>Eriophyes</i> sp.    | 5. Poison Ivy Mite Gall. <i>Eriophyes</i> sp.     |
| 3. Hawthorn Serpentine Gall. <i>Eriophyes</i> sp. | 6. Birch Bud-Gall. <i>Eriophyes</i> sp.           |

(See page 56.)



PLATE B.

- |  |   |
|--|---|
| 1. Sugar Maple Pink frost-gall. <i>Eriophyes</i> sp. | 4. Beech frost-gall. <i>Eriophyes</i> sp.               |
| 2. Manitoba Maple frost-gall. <i>Eriophyes</i> sp.   | 5. Elm mite gall. <i>Eriophyes ulmi</i> .               |
| 3. Rock Elm frost-gall. <i>Eriophyes</i> sp.         | 6. Elm mite gall. Enlarged opening on<br>under surface. |

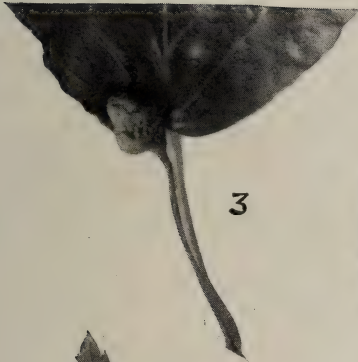




1



2



3



4



5



6

PLATE C.

1. Spiny Witch-Hazel Gall. (*Hormaphis spinosus*.)
2. Witch-Hazel Cone Gall. (*Hormaphis hamamelidis*.)
3. Cottonwood Petiole Gall. (*Pemphigus populeauctis*.)
4. Hickory Cone Gall. (*Phylloxera caryae-fallax*.)
5. Cockscomb Gall on Elm. (*Colopha ulmicola*.)
6. Basswood Mite Gall. (*Eriophyes abnormis*.)

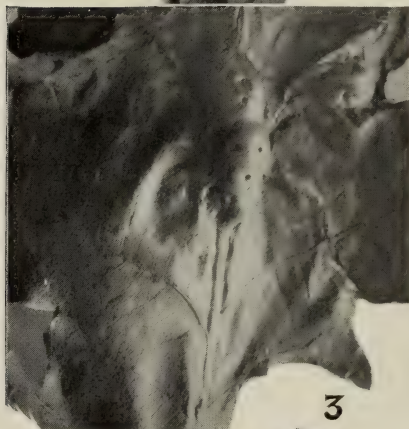




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PLATE D.

1. Furry Ball Gall on Oak. (*Andricus lana.*)
2. The Larger Oak-Apple. (*Amphibolips confluentis.*)
3. Oak Midrib Gall. (*Andricus piger.*)
4. Mossy Rose Gall. (*Rhodites rosae.*)
5. Vein Gall on Oak. (*Cecidomyia quercus-majalis.*)
6. Vein Gall on Blue Beech. (*Cecidomyia pudibunda.*)
7. Virginian Creeper Midrib Gall. (*Cecidomyia sp.*)



PLATE E.

1. Ball Gall on Hickory. (*Diplosis caryae*.)
2. Spiny Ball Gall on Wild Rose. (*Rhodites bicolor*.)
3. Ball Gall on Wood Nettle. (*Cecidomyia urnicola*.)
4. Rose Stem Gall. (*Rhodites globulus*.)
5. Ash Gall. (*Cecidomyia pellex*.)
6. Eye Spot Gall of Maple. (*Cecidomyia ocellata*.)



PLATE F.

1. Soft Maple Mite Gall. (*Eriophyes quadripes*).
2. Two specimens on left, Elliptical Goldenrod Gall. (*Gelechia gallaesolidaginis*.)
3. Two specimens on right. (*Trypeta solidaginis*.)



# Entomological Society of Ontario

1906.

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*To the Honourable Nelson Monteith, Minister of Agriculture:*

SIR,—I have the honour to present herewith the Thirty-seventh Annual Report of the Entomological Society of Ontario for the year 1906. It contains the proceedings of the Forty-third Annual Meeting of the Society, which was held at its new headquarters in the Ontario Agricultural College, Guelph, and also papers on practical and descriptive entomology which have been prepared for the information of farmers, fruitgrowers and gardeners as well as others who are interested in the work of noxious and beneficial insects.

*The Canadian Entomologist*, the monthly magazine published by the Society, has been regularly issued during the year, and has now completed its thirty-eighth annual volume. It continues to maintain its well-established reputation for scientific entomology.

I have the honour to be, Sir,

Your obedient servant,

CHARLES J. S. BETHUNE,

Ontario Agricultural College, Guelph.

Editor.

# Entomological Society of Ontario.

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Division No. 4—C. W. NASH, Toronto.

Division No. 5—GEORGE E. FISHER, Burlington.

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*Editor of the "Canadian Entomologist"*—Rev. Prof. BETHUNE, Guelph.

*Editing Committee*—DR. FLETCHER, Ottawa; H. H. LYMAN, Montreal; J. D. EVANS, Trenton; Prof. LOCHHEAD, Ste. Anne de Bellevue, P.Q.; G. E. FISHER, Burlington; J. B. WILLIAMS and C. W. NASH, Toronto.

*Delegate to the Royal Society*—A. F. WINN, Montreal.

# Entomological Society of Ontario.

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## ANNUAL MEETING.

The forty-third annual meeting of the Entomological Society of Ontario was held in its new headquarters at the Ontario Agricultural College, Guelph, on Wednesday and Thursday, October 10th and 11th, 1906; the sessions were presided over by Vice-president Dr. James Fletcher, Dominion Entomologist and Botanist, Ottawa. Among the members present were Mr. John D. Evans, Trenton, the retiring President; Mr. Henry H. Lyman, Montreal; Mr. Arthur Gibson, Central Experimental Farm, Ottawa; Mr. C. H. Young, Hurdman's Bridge; Dr. Brodie and Messrs. C. W. Nash, J. B. Williams and Paul Hahn, Toronto; Mr. G. E. Fisher, Burlington; Mr. J. Fred Smith, San Jose Scale Inspector for Ontario; President Creelman, Professors Hutt, McCready and Bethune, Messrs. Jarvis, Zavitz, Eastham, Howitt, Barlow and Peart, of the Ontario Agricultural College and the Macdonald Institute. Letters expressing their regret at their inability to attend were received from the Rev. Dr. Fyles, Levis, P. Q.; Professor Lochhead, Macdonald College, Ste. Anne de Bellevue, P. Q.; Mr. A. McNeill, Chief of the Fruit Division, Department of Agriculture, Ottawa; Messrs. J. A. Balkwill, W. E. Saunders and John Law, London; Mr. W. D. Kearfott, Montclair, N. J.

Owing to the lateness of the train from the east, there was only time for a brief meeting of the Council on the morning of the 10th, at which some necessary business was transacted.

In the afternoon of Wednesday, October 10th, the Society met at 2.30 o'clock; owing to the large attendance, over a hundred being present, the meeting was held in the spacious Massey Hall. The proceedings began with a discussion on the Codling-worm.

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## THE CODLING-WORM DISCUSSION.

DR. FLETCHER, the chairman, opened the debate by giving an outline of the life-history of the insect, the extent of its ravages and the ordinary methods of dealing with it. The following is a condensed summary of his remarks:

The Codling Moth is probably one of the most injurious insects that we have to deal with in Canada in fruit work. The remedies are all well-known, and are all sufficient, if a proper amount of care is taken by fruit growers. However, it is neglected by many, and I think the present state of the apple crop of this year is very largely due to fruit growers and farmers generally not having paid attention to the regular remedies which they ought to have made use of and not keeping their orchards clean and free from the codling moth as well as they might have done. A great deal of work and care are requisite, and as its habits vary somewhat in different parts of



Canada, it is necessary to know its life history. In my own observations I have found that east of Toronto, or about Toronto, there is practically only one brood in the year, while west of Toronto there are two. This means that in Western Ontario the fruit grower has a different and harder task before him. In Eastern Ontario, having only one brood to deal with, it can be practically controlled by the spring spraying, which everybody seems to have energy enough to carry out. West of Toronto, it seems necessary to supplement the work of spraying by banding the trees with burlap, or other material, giving the caterpillars a shelter in which to spin their cocoons, and then destroying them before the moths emerge. Where spraying and bandaging the trees are faithfully carried out, the Codling-moth is very materially reduced in numbers. But notwithstanding all that is done, the apples going to market every year are to a large extent damaged by this insect, and the unsightly appearance of the apple with injury on the side or at the calyx end reduces its selling value. We thought, therefore, that it would be advisable to have a discussion this afternoon upon this important insect pest, as in every conference of this kind some fresh points of value are sure to be brought out. It is no exaggeration to say that at least one-quarter of the loss sustained by fruit-growers every year is caused by the Codling-worm, and therefore it is a matter of great financial importance that we should learn the best and most effective methods of dealing with this pest.

Dr. Fletcher then described the proper methods of spraying fruit trees and applying bandages, and stated that, if fruit-growers would faithfully adopt this cheap means of dealing with the insect, they would save a very large amount of their income derived from orchards.

He next referred to the parasites which, in many instances, effectually keep down the insect enemies of crops. It often happens that a particular insect is extremely abundant one year while the next year few are to be found. This reduction in numbers is largely due to the work of parasites. Dr. Brodie, of Toronto, has for many years made a special study of the Codling-moth and of the parasites which affect it and a number of other injurious insects. He will tell us this afternoon what he has done in this direction and the results of his investigations. The introduction of a new parasite from some other part of the world is a very difficult matter and requires long continued efforts in order to secure satisfactory results. The introduction of the *Vedalia cardinalis* into California to destroy the Cottony-cushion scale is probably the only marked instance of successful work of this kind which has ever been brought about. It is hoped that the efforts now being made to establish a parasite of the Codling-worm in California will be successful; there are great difficulties to be overcome, and it will be some time before the parasite will become sufficiently numerous to control this enemy of the fruit. The study of parasites covers a field of very excellent and useful work, but up to the present time there have not been many practical results.

DR. BRODIE, before reading his paper, stated that he was a firm believer in the good results to be obtained through parasites. Dr. Bethune was the first person in North America to advocate the introduction of parasites to keep in check the imported insects that ravaged our wheat fields. His own recollections went back to sixty years ago when the Codling-worm was utterly unknown in Ontario; apple trees were then very large and productive. It was not till somewhere about 1858-1860 that it made its appearance. During the last ten years he had been pursuing rather carefully the study of this insect, taking in the larvae, breeding them through the winter and discovering to what extent they were attacked by parasites. He found it a very

difficult matter to procure a sufficient quantity of material for study, that is, of the larvae and pupae, during the different seasons of the year, and had never been able to get a satisfactory supply. Dr. Fletcher has told us that if the remedies prescribed, which are well known, were fully carried out, the insect would be kept well under control; he entirely agreed that these methods are the most rational and successful for combatting the ravages of the insect. Prevention by parasites has long been discussed and surprise has been expressed that their influence for good has been practically nothing. This failure, he believed, was largely due to the counter influence of secondary parasites which have an extended geographical range. He then read the following paper:

### PARASITISM OF CARPOCAPSA POMONELLA.

BY DR. W. BRODIE, TORONTO.

The all important problems of parasitism, as means for checking the increase of plant eating insects, have for more than half a century been much in entomological literature, and it seems that parasitism is recognized everywhere as the great power arranged by nature to check the rapid increase of plant eating species.

The parasitism of the Codling-moth has not been overlooked. Several species of primary parasites have been detected and identified, and surprise is often expressed that their influence for good is so little, we may say inappreciable. Now there may be several reasons for this; it may be the primary parasites we know are not the species arranged by nature to check the over increase of the Codling-moth. But one special reason I have detected is the presence of a secondary parasite, namely, *Dibrachys boncheanus*. This insect has a wide geographical range in Asia, Europe and North America, and although one of the smallest insects, exercises an immense influence in the world of insect life as a checking and balancing-up power. So far as known to us, it is without doubt an injurious insect, as most secondary parasites are.

On Aug. 28, 1905, I received from Mr. W. A. Peer, Freeman P. O., a small box containing 18 *C. pomonella* larvae and pupae. On Aug. 29, there emerged 2 moths, 1 primary parasite, *Pimpla pteralis*, and 12 secondary parasites, *Dibrachys boncheanus*. Sept. 20, 1905, a package from Stayner gave from June 2-10, 1906, 17 moths and one primary parasite, a *Pimpla*. Sept. 25, 1905, a package from Prescott, gave in June, 1906, 4 moths and 2 primary parasites, 1 *Pimpla*, 1 *Ephialtes*. I may say that I am indebted for identifications to Dr. Ashmead, of Washington, acknowledged to be the highest authority on parasitic Hymenoptera in the world.

During the many years in which I have been engaged in working out some of the problems of parasitism, I have found the primary parasitism of the Codling-moth to be about 0.5 per cent. No doubt it would be much greater were it not for the presence of the secondary parasites. In a further pursuance of the many interesting, practical and important problems presented, such as the life histories and relations of the primary and secondary parasites known to infest the larvae and pupae of the Codling-moth, and the relationships of these to allied species, preying abundantly on numerous species of Tortricidae, more or less common in open woods and thickets



everywhere throughout the Province, a careful comparison of the hosts and habits of our native species with closely related foreign ones would be of very great value. This might result in the importation of species more potent for good than our native ones.

In order to arrive at a satisfactory solution of the many problems involved in the investigation of this subject, an ample supply of material, larvae and pupae of the Codling-moth, must be at hand at all seasons, collected in many localities throughout the Province.

Surely the magnitude of the interests involved, and the rational claims of the indicated scientific method are such as to justify a sufficient effort by entomologists and fruit growers in determining the efficacy of parasitism in effectually overcoming the Codling-moth pest.

DR. BRODIE went on to say that the parasites he referred to are well-known, having a wide range over the United States and Canada. He had obtained them from the north, east and west of Ontario. The secondary parasite is exceedingly small, less than one-sixteenth of an inch, and on looking back he thought that his precautions were not sufficient, and that these minute creatures may have escaped detection. In pursuing an investigation of this kind, it is necessary for the worker to carefully fix his jars or bottles in such a way that these very small insects may not escape, but be retained for observation. The jars used should be small, but yet large enough for the atmosphere not to be too moist; they may be covered with cheese-cloth or some other thin material. This is a very important subject and should form an attractive field for work, affecting as it does our largest fruit industry.

PROF. HUTT said that he had travelled over a considerable portion of the Province this summer and found the Codling-worm exceptionally bad, especially in the Niagara district and the eastern part of Ontario. In some orchards half the crop was destroyed. It was now making its appearance in Algoma, and had this summer made some headway on St. Joseph's Island. It needs careful watching in order to keep it in check, as it is covering all sections where apples are grown. If parasites are of use in reducing the numbers of the pest, they are not increasing fast enough to control it to any extent. Something more than parasites is required, and that is the employment of the established remedies by the fruit-growers themselves.

MR. C. W. NASH said that the question of dealing with the Codling-worm was one of the greatest possible importance. As matters now stand, we are simply covering the ground with trees that to a great extent give us little in return. The remedies spoken of by Dr. Fletcher are certainly very easy of application and always show good practical results, provided that these remedies are applied thoroughly and at the proper time. The great difficulty that we find in dealing with the farmer is that he either does not believe in the practicability of these remedies, or he does not apply them just when he should. In the first place, with regard to spraying, as referred to by Dr. Fletcher, some men will spray their trees just when they happen to have the time to do so, without regard to the state of the fruit, or the tree, or the stage of the insect. In many cases where spraying is done at the wrong time, it is just money thrown away. If spraying is to be efficacious at all, it must be done before the larva has entered the apple. To catch them just at that particular time requires observation and the exercise of some little judgment. The codling moth deposits its eggs near or upon the little apple as it is first formed, about the time the petals drop from the blossoms. Those who have observed apples will have noticed that the little embryo apple stands erect upon the stem with the calyx expanded. A few days after



the petals have fallen, the stem curls over, the apple hangs down, and the calyx closes. If you spray after this has taken place, you are simply throwing away material, as there is no chance of its getting into that little calyx cup. To do your spraying, then, so that it should be efficacious, you should spray as soon as the petals fall, while the apple is erect. You then have a chance, a good chance, but even then nothing more than a good chance, of getting a small portion into the calyx cup. If you do, when the larva goes into the calyx cup and makes its first meal with the intention of entering the apple, it is very likely to be its last. Very little poison will be necessary at that time. The insect is remarkably weak and small. You cannot, however, hope to get a little poison into every apple on the tree, some will be missed and escape. But that is the point you must bear in mind, to spray at the proper time. Having done that and reduced very largely the number of larvae that are in your apples, you should supplement that treatment by afterwards bandaging the trees. If you do that, the probability is that it will not be a very great tax upon the product. A farmer in my neighborhood has a large orchard of old trees. He sprayed at the proper time, and he thought by so doing he had done everything that was necessary, and others had told him the same. I told him to bandage his trees as well, that it is much better to be safe than sorry, but he ridiculed the idea. So I took an old bag and did it myself, and eight days afterwards I went back. We took that bag off and there were seventy-two cocoons beneath the bag. These are the two remedies that are certain.

Another point to consider, and this is one that I think you should take into your deepest consideration, and that the government should enforce. It is that every man who has apple trees should be compelled to take precautions against the Codling-worm. A man who has large interests at stake will undoubtedly make some effort to protect his property, but the man on the small village lot with a few straggling trees—what does he care? The result is that these few scattered trees here and there enable cocoons to mature in a sufficiently large proportion to provide codling-moths for the whole Province. It has come to this, that unless a man will take care of his trees he should not be allowed to have them. I have tried myself for very many years to find out if there is any parasite affecting the codling-moth likely to be of any service. I have consistently failed to do anything of the kind. It was very rarely that I ever found a parasite. It may be that in some sections and in some seasons they are abundant. The parasites will have to be more abundant to show their effects, but so far as the codling-moths are concerned, I think you will have to look to your own efforts to reduce them. The very nature of the moth makes it almost exempt from any attack by insect parasites. It is practically exempt from any injury by outside enemies. In the pupa stage it is destroyed by birds. If we had more trunk-cleaning birds the orchards would have fewer codling-moths. You should take into consideration some means of compelling persons who maintain apple trees to look after them, or else see that they are prevented from keeping them.

DR. FLETCHER said that the experience in this country of trying to control people by legislation proved that such efforts were almost entirely useless. Now, the question of whether it is worth while to spray or not is one, I think, I need not discuss. All evidence and statistics show that it does pay to spray, and instead of losing 75 per cent. of the crop you can save it, as an average. At most the cost of spraying trees the number of times that it is necessary is less than 25 cents for large trees, and the number of bushels you will get off them will more than pay that expenditure many

times over. The present year, with a short crop in many sections, shows that the benefits to those that have sprayed will be enormous, and these are just the years when the work is most effective. The crop is small, it requires less expenditure for handling and shipping, and more than that, the sample is finer. When orchards are properly sprayed one inspection is sufficient to, at any rate, gain the sympathy of any fruit grower with spraying. He will spray every year after that. As to the advantage of spraying an orchard regularly, the benefits are very marked. At Ottawa, the horticulturist at the Experimental Farm now knows that he cannot afford not to spray. He has learned now to spray effectively, and the advantages are shown by the fact that for the past eight or ten years the codling-moth is almost unknown in these orchards, and I can get no specimens there. How far do you think I have to go to get specimens of the codling-moth? Just beyond a sixty-foot row of trees. I cannot find any codling-moths in our own orchards on the Farm, but need only go to these trees outside to get all I want. That shows the local benefit to the man who sprays, and it shows that although the codling-moth flies, it does not fly to such long distances as to impair the benefit to the man who sprays; while he who does not spray must pay the price that his loss entails.

In addition to the benefits from the remedies already referred to, it is most advisable to exercise the greatest care in examining and cleaning out any barrels or cases used for packing fruit which are brought in from outside sources and which may have contained infected fruit, as these may contain cocoons of the codling-moth. He had now at Ottawa cocoons of this insect with larvae still unchanged which were spun in July, 1905. A very few moths emerged in August, 1905, many in June, 1906, and some would not emerge till the spring of 1907. This, he thought, was a new fact in the life-history of the insect.

MR. G. E. FISHER: In regard to treating any troublesome insect, I always find it worth while to look for a remedy. With the farmers there seems to be a difficulty about spraying. As a rule, fruit-growers do not like to spray, and a great many do not spray, and the reason is because they have never done it. Now, I am a little surprised that in all this discussion regarding the codling-worm no reference has been made to the hog remedy. In a large orchard that I am familiar with, there are 2,000 apple trees in bearing, and there are any amount of moths. As a rule, an apple tree can well spare some of its fruit. The trees are better without it. Those apples that are attacked will fall to the ground, then we want about fifty hogs in an orchard of ten or twenty acres to follow up these apples and pick and eat them, and so destroy the worms. Dr. Fletcher has already explained the second brood that does the damage in this country. The first is a benefit by reducing the superabundance of fruit. If we can follow up those apples that fall, we have a remedy that is very easy to apply, will work out very satisfactorily indeed. A great many people seem to think that apples are of no advantage to hogs. I knew a man a few years ago, and he had a lot of apples and hogs. I told him to turn his hogs into his orchard, and he stated that he thought they would get too thin if he let them run, but finally he put them in, and the first thing he knew his hogs were too heavy to sell. They were beyond the limit. He has said ever since that there is an advantage in apples in connection with hog-feeding. I have found the hog remedy a very useful one, and perhaps you would scarcely think it, a hog has a very acute hearing, and if the ground is at all hard (we cultivate in the early part of the season), I have seen a hog's ears stand up when an apple fell and he would listen a moment and then go and find that apple, perhaps a hundred



yards away. Another thing in connection with hogs, they are pretty good scavengers. I have noticed hogs follow a caterpillar along the ground, and wait until he had caught up and then eat it. They clean up the insects very nicely.

DR. FLETCHER: You mean pigs, not old hogs, do you not?

MR. FISHER: I mean growing pigs.

DR. FLETCHER: Did you find that the pigs rooted too much?

MR. FISHER: No difficulty in that way. On different occasions the orchard was sown with peas and before the peas were ripe the apples were falling. The pigs not only ate the peas and apples, but plowed the ground as well.

MR. T. D. JARVIS exhibited some apples that were affected by the codling-worm, and spoke first of the good work performed by woodpeckers in puncturing the bark and extracting the larvae from their winter quarters. He then gave an outline of the life-history of the insect at Guelph, stating that about fifteen per cent. of the first brood of worms pupate in the summer, and the moths that come from them produce a second brood. The remainder pass over to the next year. There is thus at Guelph a very limited second brood.

DR. FLETCHER said that this percentage is very interesting as showing that there is a small supplementary brood of fifteen per cent. at Guelph. The locality is thus included in the western part of the Province where double-brooding to some extent exists. At Ottawa the proportion of early maturing moths is between two and five per cent., varying in different years. These moths lay eggs and a few larvae come from them. In the country west of Toronto—at Erindale on the Credit for instance—there are two regular broods, and very few of the first brood pass through the winter as caterpillars. These variations in different parts of the country are points which the Entomologist has to be on the watch for. He was much interested in Mr. Jarvis's account of the value that he placed upon the work of woodpeckers.

MR. PEART said: I have not been in the east, but in the western part of the Province, along the Detroit River, and going through the Niagara District, and also at Oakville, the Codling-worm was worse this year than I have ever before seen it. No particular pains had been taken with spraying as a rule, but in those sections where spraying was done at all carefully and at the right time, there have been marked results. It was owing to the scarcity of labor that spraying was not done. It is a very good object lesson to notice the effect in the district where spraying was practised, and compare it with those where it was neglected.

MR. ZAVITZ said that apple-growers in County of Durham had made enquiries regarding an insect that attacked the calyx end of the apple, but did not penetrate into the fruit. He wished to know whether there was any other insect that did this, or was it the codling-worm?

DR. FLETCHER replied that there are two other insects that attack the apple—the Plum-moth *Semasia prunivora*, Walsh, called also the Lesser Apple-worm in British Columbia, and a small caterpillar in the Province of Quebec. The latter bores under the skin and works near the surface, destroying the value of the apple for packing and shipment.

MR. JARVIS suggested that the insect referred to by Mr. Zavitz might be the second brood of the Codling-moth, but Mr. Zavitz thought not, as it simply worked around the head of the apple.

MR. FISHER: In regard to the right time to spray for Codling-moths, Mr. Nash said that the bee people were very anxious that the prohibition



should include the entire period of bloom. But the Government would not allow that, and the Act read "during the period of full bloom." It has been my experience that you cannot get after the codling-moth any too early, and it is desirable to spray before the blooming is entirely completed. We think this is correct.

DR. FLETCHER: I do not personally; have you seen the moth or eggs before the blossoms have fallen?

MR. FISHER: Yes, I think so.

DR. FLETCHER: At Ottawa the moth does not appear for 8 or 10 days after the blossoms have disappeared. In Nova Scotia I have found fresh eggs on apples as large as marbles.

MR. FISHER: We find better results from spraying before the bloom is entirely completed.

DR. FLETCHER: But you have not found the moth or eggs?

MR. FISHER: I think so.

DR. FLETCHER: That is an important point.

MR. FISHER: I have not been doing any packing of fruit, but those who do pack fruit say that our pears have no codling-moth this year, while apples are badly affected. Pears have escaped the attack. Is this the general experience?

MR. JARVIS: At Guelph we made examinations and found plenty of the codling moths in the pear, but did not notice whether it was less abundant than usual.

MR. FISHER: Our pears are usually pretty wormy, and it is very disappointing to have to throw out a nice large pear for the sake of a small hole. In previous years we have lost quite a large quantity.

MR. JARVIS asked what varieties of pears are most abundant this year? Is the Flemish Beauty free from worms?

MR. FISHER replied that there is a good pear crop this year, and that he believed the Flemish Beauty to be free. It might be of interest to mention that some Clapp's Favorite pears were shipped from Burlington to Glasgow this year successfully; they went through safely and sold at a high price.

DR. BRODIE: I should like to say that very few people have ever seen the eggs of the codling-moth. I have been fortunate enough to see them. The process is this, the egg was laid at the lower part of the apple; it is very small, of course. In about an hour after hatching the larva had moved to the upper part of the apple and commenced making holes. I think it has been mentioned that the larvae eat the skin of the apple. This is a mistake; larvae bite a hole in the skin, but do not eat the portions bitten out; they are laid aside and very little is swallowed. In about a day they are buried in the fruit and they immediately turn around (my own experience) and close up the opening with silk. Six species of parasites have been described in North America. These parasites thrust their ovipositors into the larvae through the opening made by the worm. We all know that there is about two or three days' difference in the emergence of the larvae from the egg. A large number, say 10 or 20 per cent. perhaps, will come out in the beginning and another proportion at the end of the week. If you wished to follow it up, you would have to be spraying continually. The larvae do not emerge all on the same day, perhaps not in the same week. Larvae that have come out of the same brood will be apt to emerge at different times.

DR. FLETCHER: The time of egg-laying and hatching is a very important point. The old accounts state very positively that the egg was laid in the calyx of the apple, and that in spraying you had to get your Paris Green into that cup. Later observations by Professor Washburn, in Oregon,

show that the eggs are laid on any part of the apple, and Mr. Simpson found as many on the leaves as on the fruit. The main benefit from spraying is not so much that you get the spray into that cup, because the caterpillars begin life both on the leaves and fruit. They crawl about a little and then penetrate the fruit. I have seen them when they first get into the cup of the apple; they have there a place to get a purchase to make the first hole, and they are able by pressure upon the opposite side to penetrate the skin. The egg is exceedingly minute and like a little fish's scale, perfectly flat and silvery. It does not stand up as a prominence on the side. To see it you must take the apple, hold it sidewise, and look against the light and it will shine as a fish's scale. The young caterpillar hatches from that and crawls about on the apple. It is, of course, a very small insect and requires attention and time to see it. Most crawl towards the calyx end. With the second brood, the injury is often where two apples come together. At Ottawa we have come to the conclusion that with us the proper time to spray, if only one application is made, is not only not during the time of bloom, but not until even a week after the blossoms fall. The eggs are laid upon the young fruit. Nearly all apples when they are in the flowering stage are covered with a thick down, and the egg of the moth cannot be affixed to the side at that time. This is simply a matter of observation. The laying of the eggs certainly continues for over a week after the apple has formed. We never found an occasion where it was necessary to spray trees for the codling-moth during the time they were in bloom.

MR. CROW inquired whether there is any satisfactory way of killing the second brood.

DR. FLETCHER replied that bandaging the trees is the most effective method. By that means many caterpillars can be caught and destroyed. Spraying has some effect, but not so much as in the case of the first brood, because the foliage is so much thicker, rendering the work more difficult.

MR. JARVIS said that he had conducted experiments with bandages, and on one occasion found about 300 worms under a single bandage in two weeks' time. He began about the middle of July. The number of worms under a bandage varied very much.

DR. FLETCHER considered this too late for beginning and recommended the early part of the month for commencing to bandage. It was no doubt the most effective method of preventing injury from the second brood.

MR. CAESAR said that he had been this summer with Mr. Tweddle, who has an orchard of about 70 acres; and he was going to ask the same question as Mr. Crow. What time is it necessary to begin spraying to get the best results in preventing the second brood of the insects? They sprayed this orchard about three times in the early part of the season, and then did not spray again until about the 20th of August. He noticed in looking over the apples (Northern Spy) that they would probably have about thirty-three per cent., or more, of them affected by the moth. He wondered whether if they had been two weeks earlier this loss might have been prevented. As for bandaging, with an orchard so large it was almost impossible for them to do it. He thought they would do better to give the time to spraying. He wished to know what is the estimated cost of bandaging.

DR. FLETCHER: The question is a matter of expenditure and returns. If it pays, it does not matter if you pay \$1,000 to bandage if you make \$2,000 out of it. For the returns that you get from it, bandaging certainly pays, and it must not be forgotten that the very word spraying was unknown twenty years ago. Mr. Fisher will remember the first old Robertson pump, made at Grimsby. Now thousands of pumps are sold every year,



and more people buy them every year. Mr. Tweddle would have made it pay if he had bandaged his trees. The most important question was whether he could get the actual labor necessary. It certainly will pay if you destroy the caterpillars, for they destroy the fruit.

MR. JARVIS: Was the orchard sprayed the previous year?

MR. CAESAR: It was sprayed during the past three or four years. There are twenty-five acres in the orchard. It was little pruned and had been overrun with the canker worm. \$3,000 was made out of the orchard, so he thought it paid to spray. As to pears, he saw very few of his pears affected by the codling-moth.

DR. FLETCHER: The question of the exemption of pears this year is very interesting, and I can only suggest that it has something to do with the season. The effect of the seasons on insects is sometimes very much more apparent than on plants.

MR. JARVIS: What was Mr. Tweddle's experience in bandaging? Why has he given it up? Did he use burlap?

MR. CAESAR: The real reason was the difficulty in getting labor. Mr. Tweddle spoke to me and said he would like to bandage a number of his trees. We prepared a quantity of bandages of simply coarse sack material, with the intention of putting them on his trees; but we could not get men enough to go around the orchards, and the owner believed that he had been so successful in spraying in previous years that he could do without the bandaging.

MR. JARVIS: If there were 300 worms under one bandage in two weeks' time, it should pay to bandage. I found here at the College that bandaging was of very great benefit.

DR. FLETCHER: We have come to the conclusion that spraying is a good practice because we get clean orchards. But where there is a second brood, that must be supplemented by bandaging the trees. Mr. Fisher's experience that pigs and sheep, particularly pigs, destroy the infested apples and thus do a great deal of good in orchards is important. The time to spray will vary in different localities, and it will also vary with the different varieties of apples, as different varieties flower at different times. Mr. Fisher's experience is that it should be done as soon after the time of full bloom as possible. I find no advantage in that, and there is certainly a great disadvantage in spraying during bloom to those who keep bees, for direct experiments have shown that bees have been poisoned by sucking nectar from the flowers or drinking liquid from trees that were sprayed. Therefore, I for one think that the Ontario law is very well framed as it is, and that it should be made a misdemeanor to spray trees while in blossom; because bees are now an important part of the agriculture of Canada and particularly they are very useful to the fruit-growers in effecting the fertilization of blossoms. The time when to spray is after the blossoms have fallen, and then it must be done well. Cover the whole tree with spray and use a proper nozzle; the nozzle is as important as the material and the pump. To get a very fine spray it is desirable to find out the very best implement. We have in Canada an excellent pump, the Spramotor, with the movable discs, invented by Mr. Fisher, which is the best form of spray nozzle I have ever used. It enables one to use a very small quantity of liquid, for what is required in spraying is to have the liquid so fine that it falls on the trees as a mist or as a fine spray, and as soon as the spray begins to drip it is time to remove nozzle to another part in order to save material and injury to the trees. Arsenate of lead is highly recommended and its advantages are that it is in a finer state of division than Paris Green,



but the application must be three times as strong as Paris Green to get the same results; it also remains longer on the foliage because it does not wash off so easily. Being finer, it will remain in suspension better, and therefore arsenate of lead is, except for the matter of color, rather better than Paris Green. The danger is that in color it resembles other substances in domestic use, and therefore he did not like to recommend it for general use. It is very effective, and the mixture, if of proper strength, is safe in the hands of careful men, but it must be used carefully. It has been placed on the market in a convenient form under the names of Bowker's Disparene and Swift's Arsenate of Lead. It is a very powerful poison and very effective, but on account of the danger I have referred to, I do not recommend it except with the above named provisoes.

DR. BETHUNE: I have employed the bandaging system a little and found it very effective indeed in catching the insects. The one great difficulty about bandaging is that it must be properly attended to. If you do not look after the bandages regularly, and at sufficiently short intervals, you are simply providing a most convenient place for the worm to conceal itself in and to change to the chrysalis stage. If the bandages are taken off at least every ten days and the larvae and chrysalids removed from the tree, it is a most effective and useful remedy, and is probably the only really good remedy that we have against the second brood of the codling-worm, with the exception of Mr. Fisher's plan of allowing sheep or pigs to devour the fallen fruit. Where a man has only a few fruit trees, he certainly ought to do that work himself and gather all that falls and destroy it. It is no use to gather a week after it has fallen. The drawback is that of labor and expense. I find that to examine properly a single bandage it takes at least ten minutes, because the larvae hide themselves under bits of loose bark and conceal themselves very thoroughly, and it requires a very good eye to find where the creatures are, so that it all takes time and care. No doubt that labor might be saved to some extent by having some convenient form of scraper which would scrape them off and save this troublesome work. You will, however, find under the bandages a considerable number of the worms they have not had time to conceal themselves, and these you can easily get rid of.

The question of parasites was brought before the Minister of Agriculture for Ontario in consequence of a paragraph in some of the newspapers in which he was credited with having discovered, or having available, a parasite to wipe out the codling-worm. He wrote to me on the subject and asked for information, as he was credited with a great deal more responsibility than he has any desire to have placed upon his shoulders. I told him that it was hardly possible to hope for an effective parasite, because the creature during the greater part of its life was inside the fruit and out of the reach of parasites. The only time for the parasite to attack the insect is during the very short period between the emergence from the egg and the time it is buried away inside the fruit, and then again it might be attacked after it has left the fruit and is proceeding to crawl to some convenient place before changing into a chrysalis. However, at his suggestion, I have been making inquiries both in California and at Washington and expect very soon to have some fuller information.

One other point which has been referred to I should like to emphasize, and that is the usefulness of birds in destroying these insects. A very large number of the larvae are destroyed in the winter time by woodpeckers, creepers and nuthatches. These birds ought to be encouraged in every way. Good work is also done by the chickadees and other birds. The

chickadees may be kept around an orchard or garden by helping them out with a little food during the winter. A good plan is to hang some suet in the trees.

The remedies then for the codling-worm are, first, spraying to get rid of the first brood, which can be exterminated, or nearly so. Spraying at the proper time and in the proper manner, as has been described this afternoon, should be resorted to, and also the removal of all fallen fruit. For the second brood, there is the bandaging. Then, after that come the woodpeckers and other birds. We cannot trust much to parasites, but we may be quite sure that our enterprising Minister of Agriculture will use every effort to bring the parasites, if they are found to be effective, into this country and make use of them here.

DR. FLETCHER said that parasites are not useless by any means. There are internal parasites as well as external parasites, and some of these parasites would be able to reach the worm in the apple. The larvae of the large Pigeon Tremex, which bores deep in the solid wood of maples, is parasitized by the two large *Thalessas*. There are several parasites which are also able to find out their hosts in the wood of trees. We do not know everything yet about parasites, but we must not say that they will not do this work. There are several parasites of the Codling-worm, as Dr. Brodie has told us, and when we find parasites in large numbers we may expect to obtain some results. To give an instance—one of the striking outbreaks at Ottawa was an aphid on birch trees, which was so abundant that the whole of the tree was covered with a black fungus, growing on the honey dew exuded by the aphid. The insect was abundant in June and July. Then we found that all over these trees affected by the plant aphid there were myriads of lady-bird beetles, and these beetles were so numerous that they wiped out the whole lot of aphids. We found ten to twenty of their pupae on a single birch leaf. What became of all those lady-bird beetles? Perhaps from a branch holding, say 50 leaves, we did not get 50 lady-bird beetles, but got a great many thousands of another parasite, forty to fifty of a little hypoparasite from a single pupa. Thus nature brings back again the balance by reducing the excessive number of beetles. Where one pupa produced a beetle, forty-nine never produced beetles but produced parasites. We do not know yet what can be effected by a Codling-worm parasite, but we must not give it up as hopeless. It is most hopeful. As Dr. Bethune showed us, though, we must not be too sanguine. With regard to the worms that burrow in the bark beneath the bandages, I find a brush with wire for bristles a convenient instrument for removing them. One was supplied with my furnace and I have made use of it to scrape off the worms on apple trees. Time can be saved with a proper implement, and a wire brush of this kind is good. The codling-worm does not change to a pupa inside its cocoon at once, but remains as a larva until just before it is going to emerge.

MR. SCOTT: How do you kill the cocoons in the burlap bandages themselves?

DR. FLETCHER: It is rather a troublesome matter. One man who bandages his trees has at the side of his orchard an India rubber wringing machine and runs them through that, or they may be thrown into scalding water. The burlaps are all taken off into a wheelbarrow and dropped into large open caldron used for sugarmaking; they are taken out at once and put back again. These are the only two methods known to me.

MR. NASH: I saw a man screw the wringer on the side of the wheelbarrow, and go through the orchard with it.



DR. FLETCHER: Hot water is probably the most effective method of killing the worms.

MR. JARVIS: Those left on the bandage and pressed, if very numerous, might spoil the bandage.

The hour for closing the discussion on the Codling-worm having arrived, the Chairman thanked those who had taken part in the discussion and called for the reports of the Directors of the respective districts.

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## REPORTS ON INSECTS OF THE YEAR.

### DIVISION No. 1.—OTTAWA DISTRICT. BY C. H. YOUNG, HURDMAN'S BRIDGE.

The season of 1906 in the Ottawa District was marked by cold, wet weather in the early part and later by an excessive drought. The most noticeable insect feature of the season was the enormous numbers of plant lice which infested every plant. Trees were much reduced in vitality and many complaints were made of the leaves falling prematurely. In going through the woods in July it was almost impossible to collect a good botanical specimen, as the foliage of all low-growing plants was covered conspicuously with the honey-dew emitted by the aphides. The elm-leaf aphis and the maple leaf cottony aphis were particularly abundant. The foliage of many fine maples was noticeably disfigured by this latter insect. Birches also suffered very much from aphids. Some fields of potatoes were badly infested with a plant louse which Dr. Fletcher tells me he thinks is *Nectarophora solanifolia*.

In the early part of the season the usual occurrence of cutworms in gardens was noticed, the species doing the most harm being the Red-backed cutworm (*Paragrotis ochrogaster*) and the Black army-worm *Noctua fennica*. This latter cutworm works particularly in clover fields, but in the Ottawa district clover was winter killed during the open cold winter of 1905-6, and this fact probably accounts for their presence in vegetable gardens this year. Where applied, the poisoned bran mash soon stopped the ravages of these cutworms.

At the time dahlias and asters were coming nicely into flower, the Tarnished Plant-bug was very numerous and did a great deal of damage in destroying the flowers and forming buds. This is a difficult pest to treat. Spraying the plants with kerosene emulsion or whale oil soap or dusting them with pyrethrum insect powder, have given relief, but these remedies are not always satisfactory. In the early morning, when the bugs are not so active, many may be collected by beating them off the plants into an inverted umbrella, and then killing them by putting them into some receptacle containing water and coal oil.

The small white cabbage butterfly was not particularly in evidence in the early part of the season, but the late brood in September was very abundant and hundreds of the butterflies could be observed in some cabbage patches. Where these patches were neglected the green caterpillars soon did noticeable damage.

The Turnip Flea beetle was locally very destructive on a few farms near Ottawa. Some farmers who did not know the well-known remedy of Paris green and land plaster lost two or three sowings.



In asparagus beds, where the plants had been allowed to go to seed, many specimens of the Zebra caterpillar (Fig. 1) were noticed in September and early in October feeding on the leaves. This of course was due to the fine, almost summer weather which we have had this fall in Ottawa.

Among orchard insects the caterpillars of the Codling moth were abundant in orchards which were not sprayed, and later in the season the conspicuous nests of the Fall-Web worm were noticed in many orchards. This latter insect was also very bad in forests, ash, elm and other trees being much defoliated. In orchards these insects are not only destructive, but make the trees very unsightly. The remedy of cutting off the branches bearing the nests when these are small is such an easy one that I cannot understand why owners of good orchards allow this insect to work on their trees. A few colonies of the Red-humped apple tree caterpillar (Fig. 2) and the yellow-necked apple tree caterpillar were observed, but of course these did not do much harm. Cedars everywhere were much disfigured by the small caterpillars of *Argyresthia Thujiella*, a beautiful little white moth with bronzy bars on the wings. These minute larvæ feed on the tips of the shoots, causing them to die and lose their natural color.

I am glad to inform the members of our Society that I have been able to continue my collection of lepidoptera, most of my time being spent in working up our small forms, the micros. The specimens which I have brought with me will, I think, delight some of you. For these small moths the season has been very good at Meach's Lake, where I spent the summer, but speaking generally, I do not think the season was as good as 1905, at least in the Meach's Lake district.



Fig. 1.—(a) The Zebra Caterpillar.  
(b) The Moth (*Mamestra picta*).

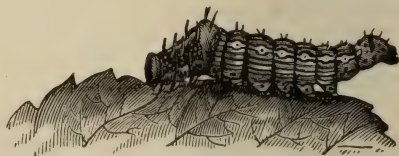


Fig. 2.—The Red-humped Apple Tree Caterpillar (*Notodonta concinna*).

#### DIVISION No. 2.—MIDLAND DISTRICT. BY C. E. GRANT, ORILLIA.

Though I have been very busy with town work this year, which has prevented me from doing a great deal with the net, I have observed that most insects have been unusually common; at the same time the rapid growth of vegetation has apparently reduced the destructiveness of some species. The chief complaint made to me in this neighborhood has been with regard to the Buffalo beetle, which has become quite a nuisance here. Dr. Fletcher was kind enough to send to the *Packet* newspaper of Orillia the best methods

of prevention; at the same time there does not seem to be any permanent remedy if you do not close your houses up in the spring time. The cutworms were very abundant and our old stand-bys, the codling moth and onion maggot were, as usual, destructive. The currant sawfly was also abundant this year, though for two years previously I left some bushes unsprayed and they were not at all eaten. Tent caterpillars were not numerous in the spring, but the Fall Webworm was to be seen nearly everywhere in September. The Tussock moths, though common as moths, do not do much harm as far as noticed here. There has been no complaint of the Pea weevil, though I have asked several intelligent farmers of the neighborhood to inform me of their ravages if noticed. Altogether I might say that this district has not been troubled with any serious outbreak of insect pests. Though the season has been an exceptionally fine and warm one, as I said before, I have not been able to give much time to entomology this year, but I have added one more *Plusia*, also *Harrisimemna trisignata* and *Arsilonche albovenosa* to my collection of local moths. I also have to report the second capture of *Junonia cœnia* in Orillia.

DIVISION NO. 3.—TORONTO DISTRICT. BY J. B. WILLIAMS, TORONTO.

The Tussock moth, as usual, did a good deal of damage to the shade trees in Toronto. About the middle of July the caterpillars began to let themselves down from the trees by a thread to the ground, and then ascended the trunks to pupate. Many of them were very small, and had a sickly yellowish look, and made poor little cocoons. Such specimens, I imagine, had been suffering from parasites, and on some trees the proportion of these small cocoons that seemed to come to nothing was very large. I saw a cluster of eggs on August 5th, but there do not seem to me to be as many eggs as usual on the infested trees.

The row of chestnut trees from which I had the cocoons collected last year, had some caterpillars on this year, but they were not nearly so numerous as on some neighboring trees, so that the destruction of the egg masses last year evidently did some good.

Apple trees around Toronto have been a good deal damaged by the Codling moth. In two orchards that I examined, one in the city and one about a mile outside, a very large proportion of the apples had been rendered quite worthless by the ravages of this pest.

I visited Niagara Glen in September, and found the Walking stick insects almost as numerous there as they were two years ago. Several large basswood trees had been completely stripped of their foliage by these creatures, and I noticed a Chestnut oak (*Quercus prinus*) some ten or twelve feet in height, with about two-thirds of its foliage destroyed, but the swarms of Stick insects that were upon it must, in a few days longer, have cleared off every leaf.

DIVISION NO. 4.—HAMILTON DISTRICT. BY GEORGE E. FISHER, BURLINGTON.

In making my report of insect conditions in the Niagara District, which as a Director of the Entomological Society of Ontario I am supposed to represent, I can speak advisedly of my own immediate section and of such particulars as came to my notice during occasional visits to other parts of the district.



The phenomenal increase of the San Jose scale and of the Fall Web-worm and the attack of the Codling worm upon the apple crop, which was unprecedented in severity, were the most conspicuous features of the year.

The Curculio, aphid, potato beetle, asparagus beetle, cabbage worm and a host of others were everywhere present and ready to take advantage of any grower's neglect. Wireworms are making considerable trouble in garden land, and the Spruce Gall-louse is continually cropping up and is now known to be widely distributed. Tent caterpillars and Canker worms were not plentiful.

As our growers understand it, the Wireworms require three or more years to complete their life circle, and are in the pupa stage during the months of August and September, when they are easily destroyed by deep and frequent plowings and cultivation, but unfortunately the gardeners' land at this season is so fully occupied with growing crops as to render such treatment impracticable, and the pest continues.

Opinions differ as to the behaviour of the Spruce Gall-louse and the people are looking to the entomologists to determine its life history and habits definitely and to suggest a remedy. In the meantime they are picking off the galls, spraying and fumigating, thus holding it in check where this was done.

The Asparagus beetle has increased surprisingly. Small beds may be protected by the hen-and-chick method, but in large plantations involving several acres this is scarcely possible. There are instances of the young growth being covered with beetles before reaching marketable size, which disfigure both by gouging into it and by depositing their black eggs in large numbers. In this condition it is valueless.

Asparagus rust is also very troublesome. The only convenient remedy we know of for large blocks is careful and persistent spraying of the growth, after cutting is discontinued, with Bordeaux mixture heavily charged with arsenic, which will reduce both rust and insects. Some of our people have signified their intention to give up the struggle, which is to be regretted, as asparagus is generally appreciated, and under ordinary conditions is a source of considerable revenue to the growers.

Copper sulphate is being much used on potatoes in the form of Bordeaux mixture with arsenic, being first applied immediately after the first hoeing and at regular intervals until about five treatments are given. In this way blight is lessened, the vines retain their leaves, the crop is increased, the quality improved, and the bugs do not at any time become plentiful, for when larvæ are young they eat much more ravenously than they do later on and with less discrimination.

Notwithstanding the pains it takes to advertise its presence, the increase of the Fall Web-worm is very marked indeed, which can be attributed only to careless neglect on the part of the growers.

Grape-rot was prevalent in many sections and the free use of Bordeaux was found to be very effective in controlling it. Four or five treatments are necessary, the first treatment being given before the buds open. Where this early spraying was omitted the rot was much more general, especially on the red and white varieties, which in many instances when not sprayed early showed a waste of from twenty to fifty per cent.

There is no insect so widely distributed and so destructive to the fruit crop of the country as the Codling moth, which causes the loss of many thousands of dollars annually. This was pre-eminently a Codling moth year, the worst on record. In many apple orchards one-half of the crop was wormy,



and in some the proportion of injury was even greater. How to lessen the ravages of the Codling worm is an intricate problem for apple and pear growers who resort to various means. The most popular remedies are spraying with arsenic, bandaging, and keeping hogs and sheep in the orchard. Spraying, to be effective, must be done while the calyx remains open and before the fruit turns down, which will be useful only in reducing the first brood. Bandages should be applied early in June after the rough bark has been scraped from the trunk and large limbs. Being thus deprived of the natural shelter, the larvæ will continue their pilgrimage until they ultimately come to the snug quarters which the bandage affords, where they will remain. If these bandages be removed, and, after the worms have been destroyed, be returned to the tree at intervals of ten days and this be continued throughout the season and until after the crop is harvested, the evil will be materially lessened. Notwithstanding the great advantage which is sure to follow, these methods require more time and labor than the average farmer is likely to expend under existing labor conditions. In the Niagara district there are a good many successful apple and pear orchards standing in sod, and the owners unhesitatingly declare in favor of this treatment. Some cultivated formerly, but have abandoned cultivation. Others have part of their orchards in sod and part in cultivation, and say the trees in sod give the best results. They all agree that the grass must be kept pastured off very closely and never be allowed to get much top.

Hogs and sheep are usually kept in these orchards. The advocates of this method claim that their trees bear more regularly, that the fruit is more highly colored, and keeps better than that from cultivated trees, and that they keep the proportion of wormy apples well below ten per cent. I have observed that pruning has been carefully attended to in all successful orchards standing in sod.

I do not wish just yet to be understood as advocating sod in orchards, but have no hesitation in endorsing all of the advantage that is claimed to attend the presence of sheep and hogs. And further, this treatment is easy and much more likely to be conducted to a successful conclusion than either of the methods first mentioned.

Since its introduction into Canada never before did the San Jose scale enjoy conditions so favorable for its increase as were experienced during the past twelve months. The exceptionally mild winter suffered a much larger proportion than is usual to come through alive, and the hot, dry summer furnished ideal weather for rapid multiplication. It is needless to say that the scale made the best possible use of its opportunity and that the increase and spread were much greater than was ever before observed in this country.

This remarkable increase and the effect upon the trees were so easily seen that many growers question the possibility of combatting the scale successfully, and are taking no action. At the same time a few others, who have counted the cost carefully, and considered the advantage of both saving their orchards, and disposing of full crops on bare markets, have used lime and sulphur thoroughly cooked and freely applied for four or five years, with exceedingly gratifying results. These men did not shrink from the necessary expenditure, and besides maintaining their orchards in the highest possible condition of health and vigor, have realized greater net profits from them than they ever did before the advent of the San Jose scale, and this, too, in the midst of infested surroundings.

## EVENING SESSION.

Wednesday, October 10th, 1906.

A public meeting was held in the Massey Hall of the Ontario Agricultural College at 8 o'clock, p.m. Notwithstanding the inclemency of the weather, the first snowstorm of the season prevailing at the time, the large hall was nearly filled with an appreciative audience, including many of the students from the College and Macdonald Institute and some visitors from the city of Guelph. The chair was taken by Dr. Fletcher, the Vice-President, who opened the proceedings by congratulating the Society upon its successful removal from London to Guelph, and on the excellent arrangements that have been made for its library and collections by the authorities of the Ontario Agricultural College. He believed that the Society would fully appreciate its new home and find its usefulness was very greatly extended by its being placed in the midst of an enthusiastic band of young men and women students. When these completed their courses of instruction they would scatter all over the country, and carry with them much they had learned through the instrumentality of the Society; many of them, too, would become active members here and continue their connection after they had left. He looked forward with confidence to the bright days in store for the Society in which it would fulfil the duties that devolved upon it in a larger measure than ever before.

PRESIDENT CREELMAN gave a warm and hearty welcome to the Society and expressed the pleasure that he and all connected with the College felt in having its headquarters in their midst. Last year he was proud of the meeting, which was held here at the College, and wished that we might have it every year; now he was glad to say that this had come to pass and that these annual meetings would, as a rule, be always held here. This Ontario Entomological Society is a great Society, not so much in numbers as in the value of the work that it has accomplished, and which it continues to perform. He then spoke of the two systems of education and pointed out the advantages to be obtained from a combination of a knowledge of natural history with a good general education; this he considered much superior to the old-fashioned methods in which the pupil grew up without any knowledge of the common objects in the world about him. The practical value of Entomology to farmers and fruit-growers he did not think could be over-estimated; if put into figures, it would mean nothing below millions of dollars. He was especially gratified that the chairman had described their new quarters as "home," and trusted that it would continue to be their home for many a year to come. He then placed at their disposal everything that the College could offer for their comfort and convenience, and trusted that the meeting would be both profitable and enjoyable.

The chairman then called upon Mr. JOHN D. EVANS, of Trenton, the President of the Entomological Society, to read his address. This was followed by a paper by Prof. Lochhead, of Macdonald College, Ste. Anne de Bellevue, P.Q., on "What the Entomological Society of Ontario can do for the Ontario Agricultural College." In the absence of the writer, who was unavoidably prevented from being present, the paper was read by Prof. McCready. Mr. Paul Hahn, of Toronto, then gave a description of a canoe trip for entomological purposes in the Algonquin Park, and illustrated his remarks with a number of beautiful and interesting lantern slides made from his original photographs. A hearty vote of thanks was given to Mr. Hahn for his entertaining address. The proceedings of the evening were much enlivened by musical selections, both vocal and instrumental, furnished by the College Philharmonic Society.



## ANNUAL ADDRESS OF THE PRESIDENT.

BY JOHN D. EVANS, C.E., TRENTON.

When at the annual meeting of a year ago I referred in my address to its being the first meeting held at the fountain-head of Economic Entomology for the Province, little did we surmise that this noble Institution, the Ontario Agricultural College, would so soon become the headquarters of the Society.

We extended a hearty welcome on that occasion to Prof. Franklin Sherman on his accession to the duties of Entomologist, etc., on the staff of the Ontario Agricultural College on the retirement of his most worthy predecessor, Prof. Wm. Lockhead, but we little thought that his time with us would be so brief; but no doubt he was sadly missed in his old haunts, and rejoicings were much in evidence when he returned to his former position.

During his, Prof. Sherman's, short term of office he infused fresh blood into matters entomological and laid the foundation for a more complete and thorough system of collecting and maintaining a collection at the College of the Insect fauna of Ontario.

Upon the retirement of Prof. Sherman, who could be found as his successor more worthy or capable of undertaking the duties of Entomologist for the college than our most highly esteemed Editor, Librarian and Curator, Rev. Dr. C. J. S. Bethune, one of, if not the father, of Entomology in Ontario. When this matter was settled it became a most serious consideration for the welfare of this society into whose hands could be placed the care of the Library and collections. No one resident in London could be found who had the leisure and knowledge necessary for the proper performance of the duties inherent to the circumstances. It was suggested that a transfer of the Society's library and collections be made to Guelph, where accommodations for the same and the business of the Society would be provided by O. A. College authorities, rent free, and no change be necessary in the office of Librarian and Curator.

Some of the local (London) members of Council were adverse to the proposed change, suggesting that the transfer should be made to the Normal School in London, but others of the members being otherwise minded it was proposed to take a vote of all the members of the Council. Towards this end a circular letter was issued on the 4th day of May and ultimately replies were received from all the members when the vote stood *eleven* for the removal to Guelph and *four* against it; one member declining to vote, but suggested to lay the matter over until the Annual Meeting.

As the matter stood nearly three to one in favor of the removal, the undertaking was carried out during the month of August last without accident or mishap of any kind, and the Library and collections are now installed in their new, commodious and most desirable quarters, where they will be of inestimable value, not only to the students attending the college from year to year, but to all investigators of Economic Entomology, the College being the head centre, as it were, of that department in the Province, and where they will naturally congregate and look for assistance and inspiration.

Under the present conditions the usefulness of the Society will no doubt be greatly extended. It is hoped for and trusted that the number of members will be greatly increased through the instrumentality of the precincts of the



O. A. College, and a goodly number of the names added from year to year will continue on as active members long after they have severed their close connection with the College and drifted off to the four quarters of the globe.

An agreement has been entered into by and between the O. A. College and the Entomological Society of Ontario whereby the College provides ample accommodation for the Society's Library, Collections and business requirements, free of rent and completely under its own control in every respect, and subject to the withdrawal of the same by the Society at any time they may be disposed to do so.

This present occasion is the Forty-Third Annual Meeting of the Society. During all these long years this occurrence has come around regularly and without a break.

It was in 1863 (quoting from Rev. Dr. Bethune's "Rise and Progress of Entomology in Canada," printed in the Transactions of the Royal Society of Canada and read May 26th, 1898,) that the Society had its inception at a meeting held in Toronto at the residence of Prof. Croft.

In 1872 the headquarters were moved to London, Ont., where it has remained up to the present year. It is with feelings of great regret that we have to renounce old associations of such long standing, but a change was imperatively necessary.. It is hoped and expected that the move recently made will give a fresh impetus to the good works performed by the Society in the past and that it will now enter upon a new lease of life with its range of possibilities greatly augmented.

The quantity of new literature issued during the past year has been quite up to the standard. Not only the usual number of periodicals, magazines and reports of State, Federal and Provincial authorities have been regularly issued, but reference might be made to several new books, notably a new work on "Entomology," with special reference to its Biological and Economic aspects, by Dr. Justus Watson Folsom, in which are numerous illustrations, many of them being entirely new and of a high grade.

Also "A Glossary of terms used in Entomology," by Dr. John B. Smith, a much needed work which will prove of great service to very many entomologists.

We must all deplore the great destruction of property and loss of life occasioned by the appalling earthquake and fire in San Francisco in the early part of the year and express our heart-felt sympathy with the rescued and sufferers. This, no doubt, has been the occasion of the most extensive and irreparable loss the world has ever known of both private and public collections of Insects and of Libraries relating to the same.

The season of 1906 has been an unusual one. The winter was extremely mild, especially the months of January and February, with a very light snow fall. This was followed by a very dry, cold backward spring and a very wet June; July, August and September being noted for the excessively hot and unusually dry weather.

Insect depredations, so far as I have been able to ascertain, have been but slight or of little consequence. The pea-weevil has not given any trouble. Numerous instances of the nests of the Fall-web worm, *Hyphantria cunea*, Dru., have been observed on apple, elm and other trees, but no serious injury done.

In the vicinity of Frankford a number of cases occurred where isolated oak trees had been completely defoliated, caused probably by the Forest Caterpillar, *Malacosoma disstria*, Hub. Attempts were made to procure some of the insects, but too late; it was reported that they had died in large numbers, but from what cause could not be ascertained.

For some years past in several portions of the United States, notably New York State and New Jersey, also in Cuba, a war of extermination has been declared against the Mosquitoes by draining marshes and pools and also by covering stagnant water with a thin coating of petroleum, but now the fight is being carried to our own shores, for quite recently Mr. Henry. C. Weeks, Secretary of the American Society for the Extermination of the Mosquito, has been invited to Toronto to discuss and advise with those interested as to the best means of combatting the evil on Toronto Island.

## WHAT THE ONTARIO ENTOMOLOGICAL SOCIETY CAN DO FOR THE ONTARIO AGRICULTURAL COLLEGE.

BY WILLIAM LOCHHEAD, MACDONALD COLLEGE, STE. ANNE DE  
BELLEVUE, P.Q.

The removal of the headquarters of the Ontario Entomological Society to the Ontario Agricultural College is now an accomplished fact; and whether it was a wise move or not remains to be proven by the accomplishment of better work. I must, however, congratulate the O. A. C. on the new relationship, for I see many advantages that will come by the transfer to the College, and especially to the Entomological Department.

First of all, the Entomological Society of Ontario has won a reputation that is almost world wide; it is well and favorably known wherever insect life is studied. Its publications are valued by every Entomological investigator of note, and the best workers of North America contribute regularly to the pages of the *Canadian Entomologist*. For 43 years our Society has been in active existence, and the influence it has exerted during all these years on the progress of Entomology and education along Nature-Study lines in Canada has been very great and can scarcely be estimated.

For 43 years Dr. Bethune has stuck to the ship, and under his careful guidance the shoals and rocks and bars have been successfully passed. All honor to the men who have been associated with him for many years, viz., Dr. Saunders, Dr. Fletcher, Dr. Fyles, Mr. Lyman, Mr. Harrington and our President, Mr. Evans, for their most valuable and voluntary assistance. For 43 years the Ontario Entomological Society by means of its annual reports and special popular lectures has been educating the rank and file of the people into a knowledge of insect life.

I believe, therefore, that the transfer to the O. A. C. of the headquarters of a Society such as ours, which has done so much for Entomology the world over, will give an impetus to the study of insects at the College, and the Entomological Department at the O. A. C. will become better known on account of its intimate connection with the Entomological Society.

Again, the Ontario Entomological Society has all along been known as a great educational agency. It has taken the lead in educating the public as to the life histories of the injurious insects and the best means of controlling these insects. It has also done much to foster the Nature-Study Movement which means so much for the children. With its home at the centre of the agricultural education of the Province the Entomological Society and Entomological Department will be able to co-operate more effectively than was possible in the past. I look for a great forward movement in educational lines under the new arrangement.



Under the new partnership the Ontario Agricultural College can furnish the facilities and means of doing work, viz., its laboratories, insectary and funds for travelling. The Entomological Society can furnish the men and influence. The members of the Society scattered through the Province can be brought more closely into touch with the work of the Society and the Department. Their energies can be directed to better advantage by the central agency, Dr. Bethune and his assistants; and the season's observations will, therefore, be more definite and hence more valuable.

As you all know, the Ontario Department of Agriculture publishes and distributes for the Society its annual report which contains the papers prepared by its members. This report is edited by Dr. Bethune, and is printed early in the New Year, so that the recommendations made by the members may be of service to the fruit-grower and farmer the following year. Moreover, the records and observations which are often of great value, are distributed promptly to brother observers all over the world. Now the Entomological Department, with its head as Editor of the Annual Report, is happily situated in that it can place on record before the scientific world its observations of the year.

What an incentive to ambitious students to make careful observations during the summer holidays on their farms! No other Department at the College has such facilities at its disposal for the immediate publication of scattered records and observations which could not well be published in bulletin form.

Again, the Entomological Society brings to Guelph its large collections of insects which have been carefully looked after for many years. The specimens in the collection are valuable in that they represent Canadian forms mainly, and many are types of new species described in the *Canadian Entomologist*. The specimens have been carefully named by specialists, and are thus simply invaluable for purposes of reference. These collections now become, therefore, part of the collection of the Entomological Department and are at the service of that Department for research and lecture work. Advanced students and specialists in systematic Entomology will soon appreciate the worth of such collections when they undertake the study of special groups of insects. For many years the College had but a meagre reference collection, which condition of affairs rendered the work of instruction extremely arduous and time-consuming. Students outside of the College will no doubt be encouraged to send in specimens for identification and for help; and every outsider helped increases the reach and influence of the College.

Again, the Entomological Society's library, which also comes to the O. A. C., is one of the best specialists' libraries in Canada, or the United States for that matter. It contains an unusual large number of full sets of entomological journals obtained mainly by exchange with the *Canadian Entomologist* during the 37 years of its publication. Besides these, the library contains nearly all the Entomological publications—in English, at any rate—of the last 40 years.

For research and advanced work all the books and journals are at the disposal of the students and staff. Without them the staff was formerly much handicapped for lack of literature dealing with special groups of insects.

Connected as I was with the Entomological department of the O. A. C. for many years, and having labored hard under difficulties that are now largely removed by the transfer of the headquarters of the Entomological Society to the Entomological department of the O. A. C., I feel envious



of Dr. Bethune and Mr. Jarvis, especially when I see the opportunities for work that they now have. When I take a backward look over my own early work here and contrast the meagre facilities I had at my disposal, with the splendid equipment of books, collections, laboratories and insectary that are now at the disposal of the Entomological department, I am constrained to exclaim, "How the times have changed!" But while I envy Dr. Bethune, I must congratulate him and the College on the present happy state of things, and may he live long to enjoy the work that he has so much at heart! May the Agricultural Department and President Creelman continue their generous treatment of a Department that is now in such an excellent position to do much for the Province!

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## SECOND DAY'S SESSION.

Thursday, October 11th, 1906.

The Vice-President, Dr. FLETCHER, took the chair at 10 o'clock in the Biological lecture room of the Ontario Agricultural College. There were present throughout the day a large number of students from both the College and the Macdonald Institute, in addition to the members of the Society. The first order of business was the reading of the reports of the Council, the Branches of the Society at Montreal, Quebec, Toronto, Guelph and British Columbia, and of the Treasurer, Librarian and Curator, and the Delegate to the Royal Society. This was followed by a debate on the San José Scale.

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## SAN JOSE SCALE.

Mr. J. FRED SMITH, San José Scale Inspector for the Province of Ontario, was commissioned by the Department of Agriculture to bring before this meeting of the Society the prevalence of the scale on fruit exposed for sale in Toronto and elsewhere, and the question whether this might prove to be a menace to sections of the country where the scale did not already exist. In his opinion the danger is not very great, as the fruit, when consumed, is peeled and the rinds which bear the scales are thrown into the domestic receptacles for garbage, and thus the scales are destroyed without any opportunity of spreading to trees. The larvae cannot live long without food and when the rind is removed from fruit, it quickly dries up and the supply of liquid food for the insect no longer exists. He thought, however, that if the sale of scale-infested fruit was forbidden, it would compel the growers to take more trouble to keep their trees free from it. He considered that the scale was not spreading much, but where it did occur it was becoming a very serious danger to the orchards. In small centres of infestation it could be exterminated, and those interested should use every means in their power to get rid of it. It had recently spread to Font Hill and would no doubt spread further about the different centres if not properly dealt with. He exhibited a number of specimens of apples and pears more or less encrusted with the scale.

Mr. T. D. JARVIS said that he had found the scale on trees in private grounds in Toronto, and was of the opinion that the scale must have been introduced on fruit. At the time of the Exhibition three years ago he found

that 75 per cent. of the fruit brought into Toronto that came under his observation was affected with scale. The consumers of the fruit throw out the peelings and the insects may thus be enabled to reach near-by trees, especially through the agency of sparrows and other birds. He noticed that the apples sold by Italians in the streets of Toronto were badly covered with scales.

Dr. FLETCHER contended that there was no danger of an introduction of the insect by means of scaly fruit, as the peel to which it is attached would soon lose its moisture and the insect would die from want of food. To be successful, the skin of the fruit must remain moist enough to sustain the life of the insect; the female must be ready to produce her young; and the young must be able to reach a fruit tree—a combination of difficulties which it would be hard to overcome and which rendered infestation by this means extremely improbable, if not impossible. He did not think that many people would buy scaly fruit, and a grower would not venture to sell it, if he valued his reputation. He considered that it would be unjust and wrong to legislate against the sale of scaly fruit and thus injure a vast and most important industry.

Mr. CAESAR stated that the scales were sometimes carried by ants, and as ants were often attracted to fruit peelings, they might easily be the means of transporting them to trees. Scales were sometimes attached to lady-bird beetles also.

Dr. FLETCHER said that in Germany and in the United States there had been legislative enactments forbidding the sale of any fruit infested with scales, and much inconvenience and loss had been inflicted without any compensating advantage. He considered that it would be wrong to legislate against the sale of such fruit until we are quite sure that such restrictions are necessary to prevent the spread of the insect. We must not be alarmists and magnify the danger; the infested localities in Ontario are few and small, and the spread of the scale is not by any means rapid.

After some further discussion, in which others took part, the opinion of the meeting at the close of the debate was unanimous that it would not do at the present time to make any stringent regulations forbidding the sale of scale-infested fruit and thus hamper a very important industry. As there is so much doubt and difference of opinion regarding the danger from it, and our information is so limited, it would be unwise to frame any regulations till we are quite sure of the dangers to be guarded against. It was thought highly advisable that an inspection should be made of infested trees in Toronto and the origin of the scale upon them traced as far as possible. Young trees might have come from infested nurseries, but old trees, if attacked, must have received the insect in some other way.

The rest of the morning was occupied with the reading of a paper by Mr. Lyman on "A Search for a Borer," and an address on Gall Insects by Mr. Jarvis. The latter was illustrated by a large number of original lantern pictures and a profusion of specimens of a great variety of galls.

In the afternoon the remainder of the papers on the programme were read; they will be found in subsequent pages of this report. The election of officers for the ensuing year, 1906-7, was proceeded with and resulted as shewn on page 2.

The following exhibits of specimens were made by members during the meetings and attracted much attention:

By Mr. J. D. Evans.—A series of *Eucosma Scudderiana*, with parasites and super-parasites; some interesting Noctuids, and a species of Saw-fly which had been found injuring Virginia Creepers.



By Dr. James Fletcher.—Some remarkable forms of *Colias philodice* taken at Digby, Nova Scotia, by Mr. J. Russell, together with *C. interior*, *Grapta satyrus-marsyas*, *Thecla irus* and *T. læta*, also taken at Digby by Mr. Russell. A pair of *Cænonympha kodiak* and *Erebia Magdalena* taken in the Yukon by Mr. Jos. Keele of Ottawa. Specimens of two species of wasps, *Vespa borealis* and *V. diabolica* which were reared at Ottawa from the same nest on three separate occasions. An interesting photograph of the webs made by the larvæ of *Ellopiia somnaria* at Victoria, B. C., sent by Mr. E. A. Carew-Gibson.

By Mr. Arthur Gibson.—Living larvæ of *Cicindela repanda* and specimens of the Bean-weevil, *Bruchus obtectus*. Also some specimens of rare caterpillars inflated and larvæ of *Ædemasia concinna* parasitized by *Limnaria Guignardi*, which has been very abundant this year.

By Mr. Paul Hahn.—Two cases of Lepidoptera taken in the Algonquin Park, Ontario, and a fine specimen of the tropical moth, *Thysania zenobia*, captured at Toronto.

By Mr. C. W. Nash.—Some specimens of Lepidoptera, including the Burdock-borer, *Papaipema cataphracta*.

By Mr. H. H. Lyman.—Two interesting cases of Lepidoptera, including some rare forms of micros, and specimens of *Gortyna appassioata*, *Grapta satyrus* and *marsyas*, *faunus* and *gracilis*; also a specimen of *G. satyrus* almost identical with the insect figured by Mr. W. G. Wright as *Grapta chrysoptera*, in his Butterflies of the West Coast of the United States.

By Mr. J. B. Williams.—Two living larvæ of *Ecpantheria deflorata*, which he had found feeding on violets in Niagara Glen, Ontario.

By Mr. C. H. Young.—A large case containing over a thousand specimens of Micro-lepidoptera, most exquisitely prepared for exhibition; the majority of the species included have been studied by Mr. W. D. Kearfott. Also a similar case containing many life-histories of rare Noctuids and other Lepidoptera; among them was a fine series of *Papaipema appassioata* and *P. Harrisii*, var., with larvæ; the former was reared from Pitcher-plant, and the latter from *Pteris aquilina*.

By Prof. Bethune.—The life-histories of the two asparagus beetles, *Crioceris asparagi* and *12-punctata*.

By Mr. T. D. Jarvis.—Several hundreds of examples of Galls on leaves, twigs, etc., in illustration of his paper.

By Mr. E. J. Zavitz.—A number of insects affecting Forest-trees.

At the close of the meeting a very hearty vote of thanks to President Creelman for his kindness in providing every facility for carrying on the sessions in the College buildings was unanimously adopted.

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## REPORT OF THE COUNCIL.

The Council of the Entomological Society of Ontario begs to present its report for the year 1905-6.

The forty-second annual meeting of the Society was held, by kind invitation of President Creelman, at the Ontario Agricultural College, Guelph, on the 18th and 19th of October, and was attended by a large number of the students as well as by many members from a distance. The Society was also favored with the presence of Professor J. B. Smith, State Entomologist of New Jersey, a distinguished entomologist and an honorary member of the Society, and of Mr. C. C. James, Deputy Minister of Agriculture for Ontario.



During the first afternoon the reports of the directors on the noteworthy insects of the year in their respective divisions were read and discussed; papers were also presented by Dr. Fyles and Mr. H. H. Lyman on the Tussock Moth; by Prof. Sherman on Entomological conditions in North Carolina, and by Prof. Lochhead on the experiments made during the year against San José scale.

In the evening a public meeting was held in the Massey Hall at the College and was largely attended. Addresses of welcome were given by President Creelman and Mr. B. Barlow, representing the Wellington Field Naturalist Club. These were followed by a very interesting account of the Mosquito work in New Jersey, illustrated with a large number of lantern slides from original photographs and drawings, by Prof. J. B. Smith. The second day was occupied with the election of officers and the reading of reports from the branches, as well as a number of papers on a variety of important entomological subjects.

The 36th Annual Report on economic and general Entomology was duly presented to the Legislature of Ontario, and was printed and distributed at the beginning of February—a much earlier date than usual. It contained 143 pages, illustrated with 74 figures in the text, and contained in addition to the papers already referred to, the following articles: "Insects as Nature Studies," by Prof. McCready; "Forest Insects" and "The advantages and disadvantages of the Canadian Entomologist," by Dr. Fyles; "Orthoptera and Odonata from Algonquin Park," by Mr. E. M. Walker; "Butterfly Collecting in Canada," by Mrs. Nicholl; "Insects Injurious to Canadian Crops in 1905," and the important "Entomological Record for 1905," by Dr. Fletcher; "Injurious Insects of the Flower Garden," by Mr. A. Gibson; "Forest Entomology," by Mr. E. J. Zavitz. "The Phlox Mite," the "Blue Spruce Saw-fly," and the "Bumble-bees that Fertilize the Red Clover," by Mr. T. D. Jarvis; "Injurious Insects of 1905 in Ontario," by Prof. Lochhead; a similar paper by Dr. Fletcher; and "Notes on the Season of 1905," by Mr. C. Stevenson.

*The Canadian Entomologist*, the monthly magazine of the Society, has been regularly issued. The 37th annual volume was completed in December last and ten numbers of volume 38 have now been published. The volume for 1905 consisted of 427 pages and was illustrated with seven full-page plates, one of which was coloured, and 29 figures from original drawings. The contributors numbered 62 and included writers in Canada, the United States, England, Jamaica, and the Hawaiian and Philippine Islands. The articles are largely scientific and include descriptions of ten new genera and 161 new species and varieties. There is also a series of articles on "Popular and Practical Entomology," which render the magazine more interesting to those who have not yet entered upon a systematic study of insects. It is hoped that more of those competent to write will assist in maintaining this department of the magazine.

During the winter months fortnightly meetings were held in the Society's room at London, at which a variety of addresses were given on popular scientific subjects. The attendance was not as large as might have been expected in a city with such a considerable population and the seat of a university.

The reports from the Branches of the Society at Montreal, Quebec, Toronto, British Columbia and Guelph are highly satisfactory and show much enthusiastic work on the part of the members.

At a meeting of delegates from the various Entomological Societies of the United States and Canada, held at Cornell University during the summer session of the American Association for the Advancement of Science,

our Society was represented by the Rev. Dr. Bethune. Measures were then taken for the formation of a general society to include entomologists of every grade in North America, and a preliminary constitution was drawn up which will be submitted to a meeting to be held in New York during Christmas week.

The most important event of the year as regards our Society was the removal of the headquarters from London to Guelph. Early in May, the President, Mr. J. D. Evans, sent a circular letter to all the members of the Council setting forth the reasons which led to the proposed removal and asking for their opinions on the subject. In a second letter, dated June 18th, he announced that he had received replies from all the members of the Council and that the vote stood in favor of the removal, eleven, and opposed to it four—one member abstaining from voting. He therefore declared that, as the vote in favor of the move was nearly three to one, the decision for the removal to Guelph was carried.

The Society's lease of its room in the Public Library building at London terminated its second year on the 1st of September, and another tenant was prepared to take over the premises at that date and relieve the Society of the remainder of its term of occupancy under the lease. It became necessary, therefore, to carry out the removal before the end of August. The books and collections forming our Library and Museum were carefully packed and brought to Guelph, and are now placed in their new quarters in the Library and Biological Buildings of the Agricultural College. The cabinets with their contents received no injury whatever in transit and are now conveniently arranged for reference in a part of the College Museum assigned solely to them. The Society's books and other printed matter are in a series of stacks in the fire-proof Massey Hall Library building and are kept entirely distinct from those belonging to the College. All the property of the Society continues to be under the control of its own officers and subject to any regulations that they may adopt. A written agreement to this effect between the College and the Society has been executed and a copy is appended herewith.

Much regret is felt by all the members of the Council, and no doubt by the members of the Society in general, that the headquarters should be removed from London, where they were established in 1872. Unfortunately, interest in entomology has almost entirely died out in London, and there seemed to be no one there available for the supervision and care of the library and collections. The sections also of Botany, Ornithology, Geology and Microscopy had, one after the other, ceased their active operations, and no meetings of any of them have been held during the last two years. Under these circumstances, it seemed to the majority of the Council that a change was imperative, and that a removal to Guelph would be in the best interests of the Society, as well as in accordance with the wishes of the Ontario Department of Agriculture. There is already in Guelph a flourishing branch of the Society with a large and active list of members. During the second and third years of the College course attendance at lectures in Entomology is compulsory, and in the fourth year some of the students specialize in the subject and make it a serious and scientific study—these naturally become active members of the Society and will continue their connection with it after they leave the College and scatter over the country. There will also be at Guelph a continuity of work and interest through the permanent staff of a Professor and Lecturer. The books and specimens will be much more largely consulted and the usefulness of the Society greatly extended. It is therefore believed that the removal, which has lately been effected, will conduce to the best interests of the Society.



The Council wishes to put on record its great gratification that one of the oldest and most highly esteemed members of the Society, the Rev. Dr. C. J. S. Bethune, has been appointed to the important position of Professor of Entomology at the Ontario Agricultural College. Dr. Bethune's wide knowledge of entomology and his long experience in teaching fit him eminently to fill this chair, with honour to himself and great advantage to all students who may attend his lectures. Special arrangements have been made with the Government and the President of the College, by which Dr. Bethune's services will be continued to the Entomological Society in the general supervision of its Library and in editing *The Canadian Entomologist*.

It is with much regret that the Council has to record the death of Baron C. R. Von Osten Sacken, one of our earliest honorary members, which took place at Heidelberg, Germany, on the 20th of May. This eminent Dipterist was born at St. Petersburg on the 21st of August, 1828, and for many years was attached to the Russian Embassy in Washington and afterwards was Consul General for Russia in New York. During the twenty-one years that he spent in America he prepared and published a number of works on the Diptera, and to him is due entirely the first scientific knowledge of the North American species belonging to this great order of insects.

We have also to deplore the loss of one of our oldest London members, Mr. Benjamin Green, who for many years took a deep interest in the Society and was a regular attendant at the meetings of the Geological Section. Though prevented by failing eyesight from doing any active work of late years, his interest in science continued unabated and he kept up his connection with the Society to the end.

JOHN D. EVANS, President.

#### MEMORANDUM OF AGREEMENT BETWEEN THE ONTARIO AGRICULTURAL COLLEGE AND THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Ontario Agricultural College, in consideration of the removal of the headquarters of the Entomological Society of Ontario, together with the Society's library and collections, from London to Guelph, hereby agrees to provide the Society with a separate section of the stacks in the Massey Hall building, for its library, and a room in one of its buildings for the Society's collections and other property: the books and collections, etc., of the Society are to be entirely under the control of the officers of the Society and to continue to be its separate property; they shall also be subject to any regulations that its council may draw up.

The College will provide this accommodation free of any charge for rent or supervision.

The Society shall be at liberty to withdraw from this arrangement and to remove its property at any time, on giving to the President of the College three months' notice of its intention to do so.

Dated this 6th day of August, 1906.

(Signed) G. C. CREELMAN,

President, for the College.

JOHN D. EVANS,

President of the Entomological  
Society of Ontario.



## ANNUAL REPORT OF THE MONTREAL BRANCH.

The 275th regular, and 33rd annual meeting, of the Montreal Branch was held at the residence of Mr. A. E. Norris, on May 14th, the following members being present: A. E. Norris, in the chair; H. H. Lyman, G. A. Moore, E. C. Barwick, G. R. Southee, G. Chagnon, A. Denny, A. F. Winn.

The minutes of the April meeting were read and confirmed.

The secretary read the following report of the Council:—

In submitting their report for the season 1905-06, the Council have pleasure in recording that not only has there been a continued interest in our meetings, but also that there is a growing desire in many directions for accurate knowledge of the habits of insects.

Meetings have been held monthly as usual from October to May, with an average attendance of nine, at the residences of various members. During the summer field-days were held on May 24th and July 1st at St. Hilaire, and Saturday afternoon outings were arranged for, but weather conditions interfered with most of these, and it is to be hoped that the field-day committee will arrange for similar short trips this summer, and invite all interested in natural history to join with us. The branch attended the Natural History Society picnic at Mount Johnson on June 10th, and presented the books for prizes in the Entomological Department, Mr. E. Denny capturing the first prize and Mr. Stevenson the second.

One new member has been added to our roll, Mr. G. M. Stewart, formerly of the Toronto Branch.

The following papers were read at the meetings:—

A Talk on Butterflies and Moths, A. E. Norris.

The Cotton-worm Moth (*A. argillacea*), A. F. Winn.

Difference between the Sexes in Hemiptera, G. A. Moore.

A Rare Longicorn (*Pachyta rugipennis*), G. Chagnon.

Hemiptera having Rudimentary Wings, G. A. Moore.

The Tussock Moth Situation in Montreal, H. H. Lyman.

Notes on the Geometridae of Biddeford, Maine, A. F. Winn.

An Account of the Annual Meeting at Guelph, H. H. Lyman.

The Buck Moth (*H. Maia*), A. F. Winn.

Wings of Hemiptera-Heteroptera, G. A. Moore.

An Interesting Variety of *Lina Scripta*, G. Chagnon.

Heads of Hemiptera, G. A. Moore.

North American Theclinæ, H. H. Lyman.

Theclas of Great Britain and Ireland, L. Gibb.

Canadian Theclas, A. F. Winn.

The Deaths-Head Moth, Rev. Dr. Fyles.

Notes on some Micro-Lepidoptera, A. F. Winn.

Catocala Relicta, A. F. Winn.

A Hunt for a Borer, H. H. Lyman.

Notes on *Apantesis Vittata*, E. Denny.

But few additions have been made to the cabinet during the past seasons, and good specimens in any order will be very acceptable.

Mr. Moore has entered up in the Catalogue of Montreal Insects a list of Hemiptera known by him to occur here, making a useful addition.

A beginning has been made in forming a collection of portraits of our members, past and present, and those who have not already handed in their photos are again respectfully requested to do so.

The library has been added to by the receipt of the Reports from New York State, and also the Volumes of the Canadian Entomologist, which have been bound.

At the annual meeting at Guelph, the Branch was represented by Mr. Lyman, and Mr. Winn was elected as this year's delegate to the Royal Society of Canada.

The treasurer's report, submitted herewith, shows a balance to our credit of \$49.36.

Respectfully submitted on behalf of the Council,

A. E. NORRIS, President.

The reports of the treasurer and of the curator and librarian were then submitted and adopted.

The following officers were elected for the ensuing year:—

President—Geo. A. Moore.

Vice-President—E. C. Barwick.

Sec'y.-Treas.—A. F. Winn.

Curator and Librarian—L. Gibb.

Council—G. Chagnon, H. H. Lyman, G. R. Southee and E. Denny.

## REPORT OF THE QUEBEC BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The ninth annual meeting of the Quebec Branch of the Entomological Society of Ontario was held at the house of the President on the 13th day of October, 1906.

There were present: The Rev. Dr. Fyles in the chair, Mrs. Fyles, Mrs. J. H. Simmons, Miss Fyles, Miss Bickell, Miss M. Johnstone, Miss Freeman, Miss Hamel, Mr. J. H. Simmons, Lt.-Colonel Lindsay, secretary-treasurer, and two guests.

Dr. Fyles congratulated the members on their re-assembling after the summer holidays. He then told of an excursion he had made through the border townships in the tracks of the Larch saw-fly, *Nematus Erichsonii*, Hartig. He learned that in all that section of the country there was not a first-growth tamarack remaining, and that most of the tamarack of a later growth were destroyed. A few young trees of the kind were growing in places; but a new growth of balsam, poplar, spruce and birch, varying with the nature of the soil, was occupying the broad stretches of land in which the tamarack formerly flourished.

Dr. Fyles exhibited a fine nest of the wasp *Vespa arenaria*, Fabr., which he had brought from the grounds of Mr. George Ramsay, of Little Village, P.Q. It had been built in an open field an inch or so from the ground and was supported by a few stout bents of grass and a small stem of *Aster cordifolius*, L. It resembled a round stone or a large puff-ball, and it contained a surprisingly large number of cells.

While he was examining it at Mr. Ramsay's residence, a fine female—the last of its occupants—burst from her cell and was quickly transferred to the cyanide bottle. This was on the 9th of September. The insect was a beautiful object, jet black with pure white markings; but when it was set up it soon lost much of its beauty: it had become greasy, saturated with oily matter. As the accumulated fat of the bear is its support through its long winter repose, so, probably, this super-abundance of oil in the female wasp is the provision of the insect until the opening spring.



Numerous insects taken by Miss Freeman at her country place at Lorette, P.Q., were also shown. Among them *Tropæa Luna*, L., *Autographa rectangula*, Kirby, *Catocala Briseis*, Edwards, and the handsome beetle, *Chalcophora Virginensis*, Drury.

Miss Freeman discovered in an unoccupied room—one of the windows of which had been left partly open for ventilation—about a dozen specimens of the beautiful butterfly, *Eugonia j album*, Bois and Le Conte. They had evidently flocked to the room as to a safe refuge from winter storms.

The President exhibited seed of the larger Lady's slipper, *Cypripedium pubescens*, which had come to perfection in his garden. They were contained in a ribbed fusiform pod. To the naked eye they resembled brown dust, but under the microscope they presented a very interesting appearance. Each minute brown seed was attached to the inside of a finely reticulated transparent spindle-shaped capsule, which could be readily carried by the wind, and by this provision the seeds on escaping from the pod are widely scattered.

Lt.-Colonel Lindsay then gave a most interesting account of the Caddis fly frequenting lakes and streams. These flies are very abundant in August and not only the trout are eager to make them their prey, but insectivorous birds gather them with the same intent, so that between the crop of the bird and the maw of the fish—its Scylla and Charybdis—the unlucky insect finds it difficult to steer its course.

The officers for the coming year were then elected as follows: President, the Rev. Dr. Fyles, F.L.S.; Vice-President, Mrs. Richard Turner; Secretary-Treasurer, Lt.-Colonel Crawford Lindsay; Council, Hon. Richard Turner, J. H. Simmons, Esq., Miss Bickell, Miss Freeman, Miss Hedge.

A vote of thanks to the officers, to the hostess of the occasion, and to the authorities of Morrin College for allowing the Society the use of its rooms for its meetings, proposed by Mr. J. H. Simmons, and carried unanimously, brought the proceedings of a very pleasant meeting to a close.

CRAWFORD LINDSAY,  
Sec.-Treasurer.

#### REPORT OF THE COUNCIL.

The Branch now numbers 29 members.

The Secretary-Treasurer's report will be submitted to you and will no doubt be found satisfactory.

In the course of the year, four papers on Ants and one on Aphides were read by the Rev. W. W. McCuaig, and papers on the Tussock and Gypsy moths, European butterflies, Paper-making wasps, the Death's Head moth, and the Arctiadae of the Province of Quebec, by the President.

The Council regret the departure of Rev. Mr. McCuaig from this part of the country. A vote to that effect was adopted by the Branch.

Our thanks are due to the authorities of Morrin College for having continued to allow us the use of their rooms for our meetings.

CRAWFORD LINDSAY,  
Sec.-Treasurer.



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REPORT OF THE TORONTO BRANCH, 1905-6.

The tenth annual meeting of the Toronto Branch of the Entomological Society was held in the Provincial Museum on June 19, 1906.

The President, Dr. Brodie, was in the chair, and the following were present: Mr. J. B. Williams, Mr. P. Hahn, Mr. H. S. Saunders, Dr. Abbott, Mr. A. Cosens, Mr. Fraser, Miss Mosey, Miss Blackmore, and a number of visitors.

The following officers were elected:

President—Dr. Brodie.

Vice-President—Mr. Paul Hahn.

Secretary-Treasurer—Miss Blackmore.

Librarian and Curator—Mr. J. B. Williams.

Council—Mr. Ivy, Mr. Webb, Dr. Abbott, Mr. R. Hallam.

The Secretary read the following report:

Your Secretary takes pleasure in announcing a successful and profitable season's work. In all, eight meetings in the Museum have been held, and three excursions thoroughly enjoyed by those fortunate enough to be able to attend. The average attendance at the meetings was 10.

Many very instructive papers were read, particularly those of Dr. Brodie require mention, which dealt with insect pests and methods of dealing with them. Papers read during session:

"The Tent Caterpillar," Dr. Brodie.

"Some Recent Additions to the Society's Collection," Mr. Williams.

"Collecting at Niagara Glen," Mr. Hahn.

"Parasitism," Dr. Brodie.

"Insect Intelligence," Dr. Brodie.

"The Tussock Moth," Dr. Brodie (2 papers).

"A Temagami Trip," Mr. Hahn.

One evening during the session was devoted to specimens, and proved very interesting.

Donations to the Society's collection have been received during the past year from Mr. Hahn, Mr. Saunders, Mr. Fraser, and Mr. Williams. Some work has been done in arranging the Lepidoptera, and Mr. Fraser has undertaken to rearrange the Dragon-flies.

Publications have been received from Ottawa and Washington, from the Ohio and Connecticut Experiment Stations, and from New York State Museum, and a copy of "Butterflies of the West Coast" has been procured for our library.

The Treasurer reported a balance on hand of \$6.95.

Respectfully submitted,

E. BLACKMORE, Secretary.

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REPORT OF THE BRITISH COLUMBIA BRANCH OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO FOR THE YEAR 1906.

The fifth annual meeting of the above Branch was held at the Queen's School, Vancouver, on January 26th, 1906.

The following members were present: Messrs. A. H. Bush, R. V. Harvey, R. S. Sherman, W. A. Dashwood-Jones, B. Marrion, J. Towler, R. Draper, F. Foster.

On the motion of Mr. Dashwood-Jones, Mr. Bush took the chair, in the unavoidable absence of the President.

The minutes of the last meeting were read and confirmed.

The Treasurer presented his report, showing a balance in hand, in cash and supplies, of \$15.50.

Messrs. J. R. Anderson and F. Foster (junior) were elected members of the Branch.

The retiring officers were re-elected for the coming year: President, Rev. G. W. Taylor; Vice-President, T. Wilson; Secretary-Treasurer, R. V. Harvey.

The Secretary announced that he had approached the Provincial Department of Agriculture with a view to obtaining assistance towards printing a small periodical giving an account of the work of the society. He read a letter from the Hon. R. G. Tatlow, definitely promising aid for one year.

A resolution was passed, accepting with thanks the offer of the Department, and the President and Secretary were empowered to arrange for the publication of a periodical, to be called the "Bulletin of the B. C. Entomological Society."

Two numbers of this Bulletin have already appeared, and the third is on the point of appearing. These numbers contained: Proceedings of the Branch; A Summary of the work done in B. C. up to date; Lists of interesting captures; General articles, and lists of various families of insects as they have been recorded in British Columbia. These comprise: *Coccinellidæ* (33 species), *Buprestidæ* (19 species), *Cicindelidæ* (15 species); in *Diptera*, the *Tabanidæ* (18 species), *Bombyliidæ* (23 species), *Therevidæ* (1 species), and a list of 28 species of *Odonata*. (Note by the Secretary.)

Mr. Dashwood-Jones then showed some interesting insects from St. Leon Hot Springs, Kootenay Lake, B.C., determined by Dr. J. Fletcher, including: *Basilarchia arthemis*, *Basilarchia disippus*, *Nomiades lygdamus*, *Erebis odora*, *Catocala briseis*, *Phengommataea Edwardsata* and *Sthenopsis quadriguttatus*.

Dr. Draper showed a fine series of *Lepisesia flavofasciata*, var. *ulalume*. The meeting then adjourned.

The spring meeting was held at Duncan's, on Vancouver Island, on April 19th.

The following members were present: Rev. G. W. Taylor (President), Messrs. A. W. Hanham, C. Livingston, E. M. Skinner, G. O. Day, T. M. English and R. V. Harvey.

The minutes of the last meeting were read and confirmed.

Messrs. F. Wolley-Dod, G. O. Day, and T. M. English were elected members of the Branch.

Mr. Harvey read a paper on the "Distribution of Insects in North America," calling attention to the far greater similarity between our fauna and that of Europe, than between the latter and that of eastern North America.

Messrs. Livingston and Skinner showed some rare *Lepidoptera*, the latter having a fine specimen of *Sthenopsis quadriguttatus*, from the Skeena River.

The meeting then adjourned.



## REPORT OF THE GUELPH BRANCH.

On the occasion of the forty-second annual meeting of the Ontario Entomological Society, held at the Ontario Agricultural College, Guelph, on October 18th and 19th, 1905, action was taken which resulted in the formation of a Guelph Branch of the Society.

This new Branch was organized with the following officers:

President—Franklin Sherman.

Vice-President—Richard Readwin.

Secretary-Treasurer—T. D. Jarvis.

Committee—Messrs. Sherman, Jarvis and C. R. Klinck.

An encouraging membership of 27 was secured, and the wisdom of the step was shown. The beginning augured well for live and enthusiastic work, and the most sanguine hopes have been fully realized.

During the year sixteen meetings have been held at fortnightly periods, alternating with those of the Wellington Field Naturalists' Club. The attendance averaged thirty and included visitors from the Nature Study classes of Macdonald Institute, and teachers and others from the city of Guelph.

At each meeting talks and papers were presented, which were occasionally illustrated with lantern views. Their nature will be indicated by the following classification which appears on the printed invitations sent out:

General Entomology.

Entomological Literature.

Economic Entomology.

Observations and Notes by Members.

At the conclusion of this one year's work the Branch was merged with the parent society whose headquarters are now at this place.

TENNYSON D. JARVIS,  
Secretary-Treasurer.

## REPORT TO THE ROYAL SOCIETY OF CANADA.

FROM THE ENTOMOLOGICAL SOCIETY OF ONTARIO, THROUGH MR. A. F. WINN,  
DELEGATE.

As Delegate from the Entomological Society of Ontario, it is my pleasing duty to report another year of steady progress, and that our membership is increasing very rapidly. At your last meeting the establishment of a branch in British Columbia was mentioned, and since then another had been formed in Guelph, Ont., where there are a number of active and enthusiastic entomologists.

The parent society in London, with its branches at Quebec, Montreal, Toronto, Guelph and Vancouver, and active members in every Province of the Dominion, is able to accomplish much that would be impossible if the sphere of work were limited to a more restricted area.

The last volume, No. 38, of our monthly magazine, *The Canadian Entomologist*, contains 426 pages—a contrast with the first modest one of 110 pages—and is illustrated with twenty-nine figures in the text from original drawings, and seven full page plates, one of the latter being a three-color process plate of moths, showing the beauty as well as scientific accuracy of this style of illustration. Among the sixty-two contributors to its pages, some are from such distant places as Jamaica, W.I.; Honolulu, and the Philippine



Islands. Eleven new genera of insects are described, and one hundred and forty-two new species. Articles on new species and varieties of Lepidoptera, by Dr. J. B. Smith, Dr. Wm. Barnes, Dr. H. G. Dyar, Prof. Fernald, Miss Murtfeldt, Messrs. H. H. Lyman, F. H. Wolley-Dod, A. Gibson, W. D. Kearfott.

Coleoptera, by Prof. H. F. Wickham, Major T. L. Casey, Messrs. Frederick Knab and Wm. Knaus; Orthoptera, by Messrs. E. M. Walker, and W. T. Davis; Hemiptera, by Messrs. J. R. de la Torre Bueno, E. D. Ball, D. Lange, and G. W. Kirkaldy; Hymenoptera, by Dr. W. H. Ashmead and J. H. Lovell; Diptera, by Mr. W. D. Coquillett, Miss C. S. Ludlow and Dr. Grabham. Life histories are given more or less completely of *Eupithœcia interrupto fasciata*, *Apantesis virgo*, *parthenice* and *rectilinea*, by Mr. A. Gibson; *Apantesis proxima*, by Dr. O. Siefert; *Gortyna thalictri*, by Mr. H. H. Hyman; *Delphastus pusillus*, by Mr. W. E. Britton.

A series of articles on Practical and Popular Entomology consists of the following:

"The Pear-tree Psylla and how to deal with it," by Mr. George E. Fisher; "Entomology in Schools," by Mr. H. S. Saunders; "How do Insects pass the Winter?" by Dr. James Fletcher; "Notes on Collecting Aquatic Hemiptera," by Mr. J. R. de la Torre Bueno; "Canadian Three-color Process Illustration," by Dr. James Fletcher; "The Struggle with the Codling Moth," by Prof. W. Lochhead; "Granary Insects," by Mr. A. Gibson; "A Method for Measuring Insects," by Mr. J. R. de la Torre Bueno; "The Buffalo Carpet Beetle," by Dr. James Fletcher.

Articles on Classification include a catalogue of the Aphidæ, by Mr. G. W. Kirkaldy; "The Bees of Oregon," by H. L. Viereck and others; "The Three Ranatras of the Eastern United States," by Mr. J. R. de la Torre Bueno; "Mosquito Notes," by Miss C. S. Ludlow.

Among the miscellaneous papers may be mentioned: "Observations on Lampyridæ," by Mr. Frederick Knab; "Notes on Types in the British Museum," by Mr. H. H. Lyman; "Remarkable Flight of *Corisa* (Water-boatmen)," by Mr. D. Lange; "Spiders of Rockport Cave, Mo.," by Mr. C. R. Crosby; "Influence of the Apidæ upon Geographical Distribution of certain Floral Types," by Mr. J. A. Harris; "Oviposition of *Bibio Femorata*," by Mr. A. H. Girault.

Book notices have appeared promptly of new entomological works.

The forty-second annual meeting was held in October at the Ontario Agricultural College, Guelph, with an attendance at some of the meetings of over one hundred, and the Society was favored with the presence of Prof. John B. Smith, State Entomologist of New Jersey. Reports were presented on the injurious and other insects of the various districts in Ontario, from the different Branches and Sections of the Society, and addresses and papers were given on a variety of subjects. The thirty-sixth Annual Report of the Society to the Ontario Government has been published, comprising one hundred and forty-four pages, and, as usual, contains a full account of the work of the previous year, and the papers read at the annual meeting, as well as numerous articles of an economic nature, giving to fruit-growers and agriculturists an account of injurious insects along with the best methods of attacking them.

Among these may be mentioned: "A Review of the Mosquito Work in New Jersey," by Dr. J. B. Smith; "Experiments Against the San José Scale," by Prof. Lochhead; "Entomological Conditions in North Carolina," by Prof. F. Sherman; "Reports on Insects of the Season 1905," by Prof. Lochhead, Dr. Fletcher, Dr. Fyles, Dr. Bethune, and Mr. C. Stevenson:

"The Tussock Moths," by Dr. Fyles and Mr. H. H. Lyman; "The Phlox Mite; the Blue Spruce Fly, and, On Bumble Bees that Fertilize the Red Clover," by Mr. T. D. Jarvis; "Forest Insects," by Rev. Dr. Fyles and Mr. E. J. Zavitz; "The Advantages and Disadvantages of the Canadian Entomologist," by Rev. Dr. Fyles; "Butterfly Collecting in Canada," by Mrs. Nicholl; "Orthoptera and Odonata from Algonquin Park," by Dr. E. M. Walker; "Insects as Nature Studies," by Prof. S. B. McCready; "Injurious Insects of the Flower Garden," by Mr. Arthur Gibson.

The library now consists of over eighteen hundred volumes, and a card catalogue according to subjects has been begun. The collections at London are open to the public three days a week, and advantage is taken of this opportunity, the number of visitors being increasing.

The branches are all in a satisfactory state, and our friends in British Columbia have decided to issue a quarterly "Bulletin," the first number of which has just appeared, and contains much information on the insects of British Columbia, particularly on the Coleoptera. It was felt that, as the members in that Province are so widely scattered, a medium of communication would bind them together, and we should like to see the members in the Maritime Provinces and also in the North-West follow a similar course, so that our Society could have a chain of branches from the Atlantic to the Pacific.

#### REPORT OF THE LIBRARIAN AND CURATOR.

During the year ending August 31st, 1906, thirty-eight bound volumes have been added to the Library, making the total number on the register 1900, also a large number of periodicals and pamphlets. Among the new books may be mentioned the Autobiography of the late Miss Eleanor Ormerod, LL.D.; Mr. A. G. Weeks's Illustrations of South American Diurnal Lepidoptera; the second part of Prof. Packard's Monograph of the Bombycine Moths; Mr. W. G. Wright's Butterflies of the West Coast of the United States; and Prof. Needham's May-flies and Midges of New York. During the year 38 volumes were issued to local members.

Owing to his appointment to the Professorship of Entomology at the Ontario Agricultural College, which took place on the 1st of June, the Librarian and Curator was absent from London during the last quarter of the Society's year. There are, therefore, few acquisitions to the collections to be recorded for this season, and the attendance of visitors during the summer months was almost entirely precluded. The following contributions have been made to the collections since our last report, and our grateful thanks are due to the kind contributors: 35 specimens of Lepidoptera, Coleoptera and Hymenoptera, by Dr. James Fletcher, Ottawa; 23 specimens of Lepidoptera by Mr. H. S. Saunders, Toronto; 118 specimens, representing 63 species of Manitoba Coleoptera, by Mr. Norman Criddle, Aweme, Man.; 22 specimens of Coleoptera, by Dr. A. H. R. Watson, Port Hope; 6 specimens of Coleoptera, by Mr. A. C. Baker, London, and a number of interesting specimens of various orders by Mr. J. A. Balkwill, London.

The removal of the Society's books and cabinets and other property from London to Guelph has been safely accomplished without any appreciable injury to the specimens, and all are now placed in their new quarters in the Massey Hall Library and the Biological Building at the Ontario Agricultural College.

Respectfully submitted,

CHARLES J. S. BETHUNE,

Librarian and Curator.



## AUDITORS' REPORT.

FOR YEAR ENDING AUGUST 31ST 1906.

*Receipts.*

Bal. on hand Sept. 1st, 1905 .....	\$517 76
Members' fees .....	399 67
Sales of pins, cork, etc. ....	41 38
Sales of Entomologist .....	190 50
Advertisements .....	46 91
Interest .....	7 20
Government Grant .....	1,000 00

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\$2,203 42
*Disbursements.*

Pins, cork, etc. ....	\$ 26 95
Printing account .....	863 19
Rent .....	140 00
Insurance .....	24 00
Expense account, postage, mov- ing, etc. ....	204 37
Annual Meeting and Report.....	172 81
Library .....	12 35
Salaries .....	237 50
Balance .....	522 25

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\$2,203 42

## A HUNT FOR A BORER.

BY H. H. LYMAN, M.A., MONTREAL, QUE.

On pages 154-156 of Vol. VIII of the *Canadian Entomologist*, published in August, 1876, appeared a paper, ostensibly by Dr. Leon F. Harvey of Buffalo, describing four species of new Noctuidæ, one being *Gortyna Appassionata*. The single type specimen had been received from Mr. E. B. Reed of London, Ont. I believe it was later claimed by Grote that he wrote Harvey's descriptions, and the type specimen was doubtless sent for name to Grote, and remained in the Grote collection and passed with it to the British Museum. On the rediscovery of the species, Grote disclaimed responsibility for the name, which he said was not Latin but Italian. Although there were a very few unrecognized specimens of this species in American collections, such as the collection of the American Entomological Society of Philadelphia, the species remained unknown save for its name in the catalogues and the one type specimen in the British Museum, though certain strongly marked specimens of *Marginidens* were identified with it by a prominent entomologist, who had seen the type on a visit to London. The description was accurate enough with certain exceptions which I, at least, fail to understand. The ground color of thorax and wings was stated to be "of a dark red color, the terminal space glistening red, subterminal space wide, concolorous purple." The last clause I consider misleading, as in many specimens the space from the t.p. line to the margin is of a uniform deep brownish red color, with only the faintest indication of the subterminal line, but I confess that in one of my specimens the space between the t.p. and s.t. lines has a purplish tinge which renders it darker than the space beyond, but the statement which I consider most incomprehensible is that "it is allied to *Nitela*, differs from it by the wider, rounder reniform, the three larger superposed spots on the t.a. line, the wider concolorous sub-terminal space and the more regular lunulate t.p. line."

In 1901 or 1902, Mr. Louis H. Joutel, as Mr. Bird has so interestingly told in Can. Ent. XXXV., 91-94, discovered an unknown larva of the genus, *Gortyna*, *Hydrecia*, *Papaipema*, or what you will, feeding in the roots of the Pitcher Plant (*Sarracenia Purpurea*) in the pine barrens near Lakewood, N. J., and Mr. Bird, having secured a supply of larvæ and food plant, was able to carry to maturity a goodly number of specimens, many of which, with his usual generosity, he distributed to important collections.



Fired with the ambition to secure this beautiful and rare species, I determined to take an early opportunity of seeking it in the locality whence came the type and so prolonged a business trip to Toronto into an entomological expedition to the then headquarters of our Society.

I left Toronto by the International Limited on the afternoon of July 9th, 1903, reaching London the same evening. After supper I called upon Mr. Dearness, who very kindly advised me as to the best remaining locality in which to look for the food plant, and promised to see Mr. Balkwill in the morning as to the most likely guide to the happy hunting ground. The next morning Mr. Balkwill called for me at the hotel and after some delay we succeeded in chartering a vehicle from a livery stable with a boy to go with us. We drove some distance into the country to a likely swamp, and then, leaving the vehicle in charge of the boy, Mr. Balkwill led the way to where the Pitcher Plants grew. There were no great masses of them, and probably they do not grow that way, but they were scattered about here and there through the swamp. I searched many but found no larvæ nor even any trace of them. Once I thought I had found one, as there was frass among the leaves near the root, but I found it had evidently dropped from some larva on the tree above, and the plant was without any borer. Now, I could never be mistaken about the frass of this species as it is reddish in color. After spending over an hour in the hunt without success, I abandoned the search and went with Mr. Balkwill to where cocoons of *Samia Columbia* had been found on larch in another part of the swamp, but saw none. We then returned to the city.

The next year I made a trip to Italy and so had no opportunity of looking for this species, but last year I determined to make another attempt, and as I also wanted to make a hunt at Kittery for *G. Harrisii*, I planned a four days' trip to Prout's Neck, Me., to search for these species, have a few dips in the sea, and a little golf. I left home on the evening of the 22nd July, and arrived at my destination before 11 a.m. the following morning, and in the afternoon set out accoutred for the chase. It is a good walk from Prout's Neck to the locality I was in search of, which I had not visited for nearly twenty years, and when I found the place my heart sank, as the area where the *Sarracenia* grew was so restricted, not occupying more than about a fifth of an acre between a wood which shut it off from the road and a salt marsh. However, I set to work, and as the result of about two hours' work secured three nearly mature larvæ. I then set out on a brisk walk to the hotel, happy at my success.

The next day was bad, as it rained all day, but towards five o'clock the rain stopped and the sun came out, and I sallied forth for a walk, though it was too late to go to the Pitcher Plants. After going for some distance along the road, I came to where some evening primroses grew and started a hunt for that lovely moth which used to be called *Alaria Florida*, but for the present is known as *Rhodophora Florida*, and secured quite a number of them asleep in the blossoms. I then turned off from the road across a stretch of meadow land to a drainage ditch along which the Poison Hemlock (*Cicuta Maculata*) grew abundantly, and in a very short time I had secured over a dozen practically mature larvæ of *G. Marginidens*, which Dr. Holland calls a rather scarce species, and only left off grubbing them up because I had filled up all my tin accommodation with the roots and enclosed larvæ, and I believe I could have easily gathered fifty.

The next morning I again visited the Pitcher Plants and devoted nearly two hours more to the search, and having secured two more larvæ and a newly formed pupa, which I took to be of this species and which was dis-

closed on pulling up a Pitcher Plant, I contented myself, as I did not want to clear the locality, and so kill the goose that lays the golden eggs.

This species will, I think, always be rare in collections as the difficulties in the way of securing any large number are so great. It requires most patient search to find them, and the root of the plant is so small that it takes two plants, at least, if not more, to nourish a single larva. They appear to enter the root from the crown among the bases of the petioles of the pitchers, and when all the edible part of one root is consumed they go to another, and I found several bored roots which had been abandoned. The beautiful crimson of the moth is evidently derived from the food-plant, as even the frass is red.

The plants in the locality visited by me grow among a very spongy moss and the larvæ when full fed appear to leave the roots before pupating, and in my breeding jars they pupated in the moss. Having provided myself with a sufficient supply of the roots to bring the five larvæ to maturity, I felt that that portion of my expedition had been successfully accomplished, and in the afternoon played a couple of rounds over the course of the Owascoag Golf Club with a good conscience.

The next morning I took the train for Kittery Junction, and from there the next train to Kittery Point, a very short distance, and then set out to walk. Morning and afternoon I must have tramped fifteen miles, but did not find a single plant of *Heracleum Lanatum*, the food-plant of *G. Harrisii*, and I found little except a further supply of *Rhodophora Florida* in the flowers of *Oenothera*. In the late afternoon I returned to Portland, and left for home by the night train, which I reached on the morning of the 27th.

The five larvæ duly pupated and were taken with me on the eclipse expedition to Labrador. Just before leaving, the pupa which I had found disclosed the imago and proved not to be a *Gortyna* at all. Of the five pupæ reared, one died, one moth was unable to emerge. I performed a delicate surgical operation and removed the pupa case, but the wings would not expand. One emerged and apparently hid among the moss and so escaped notice and damaged itself, so only two perfect specimens were secured.

POSTSCRIPT.—Mr. C. H. Young of Hurdman's Bridge, near Ottawa, who has been very successful in rearing *G. Appassionata* during the season of 1906, has favored me with the following notes through Dr. Fletcher:—

On July 12th, he found the larvæ in large numbers in a very wet swamp at the upper end of Meach Lake, Que., about fifteen miles north of Ottawa, at which time they were about half grown, but were full grown by the 25th. He noticed particularly that they were found only in the large plants and where the plants grew very thickly. According to Mr. Young's observations, the larvæ leave the root of the Pitcher Plant when mature, and pupate among the old decaying pitchers that are at least two years old and lie out among the moss. A very large proportion of the larvæ found by Mr. Young were attacked by a fungoid disease or by insect parasites of two species, one hymenopterous and the other dipterous.

## TWO INSECTS AFFECTING RED CLOVER SEED PRODUCTION.

By TENNYSON D. JARVIS, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

The question of clover seed production is one of extreme interest to all who have the prosperity of agriculture at heart. While the seed cannot be considered as a staple money crop in most sections, the use of the plant



has become so extensive and well-nigh universal, that the supply of the seed is becoming more and more a matter of paramount importance. The increased use of clover is indicated by the decided advance which has already taken place in the market price of the seed; and from this circumstance it is less than ever before keeping pace with the demand for it. It would seem the natural conclusion that interest should be stimulated in the production of such a remunerative commodity, and the fact that it has not been to a sufficient extent to control the price, suggests that there may be some offsetting factors to be taken into account—which is indeed the case. A reference to the annual reports of the Bureau of Industries of Ontario, reveals almost invariably a more or less unsatisfactory yield of clover seed. Furthermore, in examining carefully a large number of heads of clover here this fall, it was found that only 42 per cent. of the florets had produced seed, and undoubtedly the percentage is frequently much lower than it is this fall. It is not unusual for the yields to be so low as to render the harvesting unprofitable. In fact so uncertain and precarious a crop is it, that on a commercial scale it is a regular crop in only comparatively limited sections of Ontario, and in the other Provinces of the Dominion is but little grown. This general uncertainty of obtaining a reasonably full yield of seed is due to various causes. The plants on heavy or undrained land may be weakened by winter heaving; or on light soils their growth may be checked by summer droughts. The soil in some sections is so deficient in its retentiveness of moisture, that it is only in exceptional years that any considerable aftermath is produced. Insect ravages, and imperfect fertilization are two other causes. In the present article we propose to deal only with the two latter factors, showing how the presence of certain insects, and the absence of certain others, combine to affect adversely the yields of clover seed.

There are fully a dozen insects which do appreciable injury to some part or other of the red clover plant, but by far the most destructive to the seed is the Clover Seed Midge (*Cecidomyia leguminicola*). This insect has gained a wide range in America, and every year causes an immense depreciation in the yield of seed. It is estimated that the loss in Ontario ranges in various localities, all the way from 25 to 75 per cent. In an examination of 50 heads of clover late in September, when in all probability some of the midges had already escaped, 164 of their larvæ were found.

The insect which is responsible for this destruction is a minute two-winged fly, which appears in May or early June, and lays its eggs on the developing heads of clover among the bristles which surround the young florets. From these eggs, which are so small as to be almost invisible to the naked eye, the larvæ hatch and find their way down the opening corolla tubes to the future seed at the base. Small as they are they may be readily seen if placed on a white surface, and appear variable in color from whitish to orange-red. They feed on the doughy seeds until fully-grown, about the last week in June, when they emerge from the florets, and dropping to the ground transform to the pupal stage just below the surface. The pupæ develop to the adult fly in time that these may lay their eggs upon the second growth of the clover for another brood of the maggots. Thus both crops of clover are attacked, and after the damage is done the midges remain to go into hibernation until another year's supply of food is ready.

In order to combat this pest, it is only necessary to bear in mind the date at which the first brood is likely to pupate; and by cutting the crop a little in advance of this time destroy the whole brood, or by pasturing until danger from the first brood is past, prevent altogether the deposition of the



eggs on the crop. In accordance with this, it is now recommended to pasture closely until the month of June, when the clover may be allowed to grow for a late crop of seed; or if the crop has been left for hay, to cut this not later than June 20th, and obtain the seed from a second crop. Where these rules are observed, the injuries of the midge can be largely avoided. However, so long as some growers persist in disregarding them, it will find ample means of propagation; and so long the rest must expect to be obliged to maintain their precautions.

Having seen how the presence of one insect is so inimical to success in clover seed production, we will notice next how the presence of another is essential to the same.

Red clover, particularly the first crop, often fails to produce seed freely owing to imperfect fertilization. To understand this we need to notice two facts: 1. This plant is incapable of self-fertilization, and is therefore dependent on outside agencies for the performance of this office; and 2. The flower is so constructed, that very few of the agencies which operate in the cross-pollination of other flowers can take part in this case.

1. Inability to self-fertilize.

Many plants are known which, owing either to the structure of their flowers, or the ineffectiveness of the pollen on the pistils of the flower from which it is derived, do not self-fertilize. The red clover is an example as we shall notice presently. The flowers or florets of which the head is composed, have the four sets of organs which we find in other complete flowers. The corolla is a long tube having its lobes curiously fashioned so as nearly to close the opening or mouth. Within and enclosed in the lower lobes called the keel, are the pistil and surrounding it the monadelphous stamens. Notice particularly that the stigma of the pistil reaches up beyond the anthers of the stamens. Owing to this peculiarity, the pollen in falling does not usually come in contact with the stigma, and the plant evidently requires the intervention of insects for its pollination. That this is the case has been repeatedly proved by the exclusion of insects from the clover plants, with the result that under such circumstances no seed was produced.

2. Limited number of agencies which can pollinate red clover. Since insects do so much in carrying pollen between other plants, let us see why they are not equally useful here. We notice by examining a floret, that in order that pollen from another flower may come in contact with its stigma, it must be borne by some insect which in lighting on the keel, is heavy enough to pull it down so as to release the essential organs (pistil and stamens) from it; and then in probing with its proboscis for the nectar at the base of the corolla, will brush on to the stigma any pollen which may have become attached to it in visiting other flowers previously. The nectar, or sometimes the pollen which it bears, is the incentive which brings insects to a flower; but in the case of the red clover, the neck of the corolla tube is so long, that of the insects heavy enough to open the flower, only a very few have mouth parts long enough to reach the bottom. Bumble bees (*Bombus*) of various species, are practically the only insects which so habitually visit the flowers of red and mammoth clovers, as to be entitled to notice as a factor in their pollination. It is claimed that wasps often visit the flowers for honey, but instead of entering at the mouth in the orthodox manner, they cut a hole in the side within reach of the honey. Bumble bees have also been charged with this to some extent, and honey-bees will follow and utilize the holes thus made, but do not enter the flower: and so do not effect pollination. However, there is no doubt that bumble bees ordinarily visit the flower in such a way as to bring pollen to the stigma.

The honey bee seeking pollen and some other insects may occasionally be factors in this work, but cannot be considered as of any importance in comparison with the bumble bee. That these statements are based on fact may be strikingly seen in the experience of the New Zealand growers of clover seed. In that country attempts to obtain home-grown seed were scantily rewarded until, about 1885, the British Government introduced several species of bumble bees. These insects reproduced rapidly, and have effected a vast improvement in the yields of seed obtained. So manifestly beneficial did they prove, that the New Zealanders are now looking about for still further species which they might with advantage import. In the summer of 1905 a letter was received by the Ontario Department of Agriculture from the Canterbury Agricultural and Pastoral Association of New Zealand, seeking information as to what species of insects perform the service of pollination in this country, in the hope that some superior to what they have might be secured.

There are in America as many as fifty or sixty distinct and described species of bumble bees. Only a few of these, however, are sufficiently plentiful to be of economic importance. In an excursion through a clover field at Guelph this fall, three species were collected, namely, *Bombus fervidas*, *B. ternarius*, and *B. borealis*; the first of which was by far the most common. About Toronto another species, *B. consimilis*, is reported by Dr. Brodie as one of the most numerous.

Since the bumble bee plays such an essential role in connection with the production of clover seed, it will be worth our while to enquire into its life history and habits, for thereby we shall be enabled to arrive at some important practical conclusions.

Bumble bees, like the honey bees of domestication, have among them three kinds of individuals; the queens or females, the males, and the workers or undeveloped females. All these will be found in a colony in the fall; but on the approach of winter, the males and workers all perish, and the fertilized queens alone go into hibernation, to perpetuate the species another year. They remain in sheltered places, and in the spring those which have survived, set out separately to found each a colony of its own. The first care is to find a suitable place for the nest which is to be the home. They often appropriate deserted nests of field mice, and also construct nests for themselves of dried grass, or moss, or of wool, locating them in a depression in the ground. In this is stored a mass composed of wax, pollen and honey, in the latter part of which a number of eggs are at once deposited. Other cells similar to the first are added from time to time, and more eggs deposited as fast as their accommodation can be provided for. Owing to this method of procedure, the resulting comb receives the characteristically aimless construction with which we are so familiar.

As the young larvæ hatch, they feed upon the mass of pollen and honey in which they lie. When fully grown, each spins a lining to the cell which it has formed, and transforms to the pupal stage, finally emerging by gnawing its way out as a perfect bumble bee. After being thus emptied, these cells are not used again for the same purpose, but become the receptacles for the honey which is collected by the new brood of bees. For some time only workers are produced, and as they become numerous enough the queen is relieved from the various duties of collecting material, building comb, and so forth, all of which she has performed until now, and devotes her energies exclusively to the laying of eggs. Thus by the end of summer a populous colony may have been built up from the slender beginning of the spring. About this time, young queens and males also are produced, and



so when cold weather breaks up the colony, a number of queens are left to multiply colonies the following year.

This gradual increase from individuals to colonies of bees accounts for the greater yields of seed usually secured from a crop of clover late in the season. The flowers of the first crop opening in the latter part of June are not, as is sometimes supposed, any less capable of setting seed; but since they must be fertilized in order to produce seed, it follows that the yield will be in some proportion to the numbers of the bumble bees, and consequently greatest in the fall.

The practical applications which we may now make of the information we have about these two insects, the clover seed midges and the bumble bee, can be presented as follows. The life histories of both alike demand that a late crop of clover be used for seed; and therefore it is the utmost folly to strive to produce it at the time when Nature's odds are most strongly against us. The abundance of bumble bees, which is so much to be desired, may be materially augmented by a policy on our part of "letting live." An instinctive impulse which seems to be inherent in man, and persists long after he has lost the overflowing animal spirits of youth, makes the lot of the bumble bee a precarious one. In so far as we can, then, let us inspire youth with a considerate regard for the rights of the weak creatures, which are so often our friends; so that these thoughtless raids may appear to them despicable as they truly are, and if we ever find that the chance discovery of a bumble bees' nest stirs up in us some latent spirit of adventure, let us firmly suppress it as befitting a worthier occasion.

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## INJURIOUS INSECTS OF 1906 IN ONTARIO.

By C. J. S. BETHUNE, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Owing to my removal from London to Guelph in the early part of June, and subsequently the transfer of the property of the Entomological Society to its new quarters, my opportunities for outdoor observations have been somewhat limited during the past summer. I have, however, received a large number of enquiries, generally accompanied with specimens, from various parts of Ontario, and frequently visitors to the College have brought injurious and other insects for identification and information. In this way I have been enabled to learn something about the most troublesome insects of the season and their distribution throughout the Province. The extensive gardens, field-crops and plantations on the College premises have also afforded convenient places for the detection of injurious species. There has been no one great outbreak to mark the year, but many forms have been more abundant than usual and nearly all the common pests have been as destructive as ever.

### GARDEN INSECTS.

The White Fly (*Aleyrodes vaporariorum*, probably) also called the Mealy-winged Fly, has been very abundant this year. My attention was first drawn to it by its occurrence in large numbers on greenhouse plants, such as fuchsias, roses, etc. In the early part of July, in order to make alterations in the greenhouses, all the plants were brought out-of-doors and remained there during the rest of the summer. Owing to this, in all probability the White Flies were subsequently found on a large number of



plants in the vegetable garden, viz., beans, beets, carrots, cucumbers, parsnips, radish, rhubarb, salsify, squash, summer savory, tobacco, tomatoes; and on sunflowers and hollyhocks and a number of perennials in the flower garden. It, or probably another species, was also abundant on wild ginger. The waxen scale-like cases, under which the larvæ live, were to be found in



FIG. 3.—Mealy White Fly. Greatly enlarged. (After Gossard).

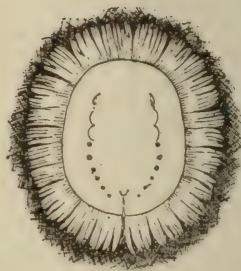


FIG. 4.—Scale-like covering of the larva. Greatly magnified. (After Gossard).

large numbers on the leaves and stems of the affected plants. In many instances considerable damage was done, not only by the loss of sap drawn off by these sucking insects, but also by the growth of fungus on the “honeydew” that is secreted by the larvæ on the foliage beneath them. The only remedy for them appeared to be spraying with kerosene emulsion. Where a greenhouse is infested fumigation with hydrocyanic acid gas should be resorted to. The accompanying figures (figs. 3 and 4) represent the characteristic forms of the fly and the scale-like covering of the larva; both are very greatly enlarged.



FIG. 5.—The Tarnished Plant-Bug, much enlarged (after Lugger).

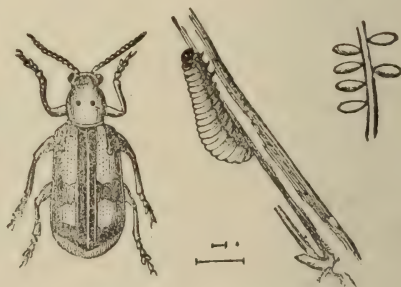


FIG. 6.—The Blue Asparagus Beetle; eggs and larva—magnified.

The Tarnished Plant-bug (*Lygus pratensis*) was another very abundant insect this year. It was first noticed in large numbers on the chrysanthemums that had been brought out of doors from the greenhouses; it attacked their terminal shoots and thus injured and in some cases destroyed the buds and future flowers. It was also to be found on asters and a number of other flowering plants in the borders, and on asparagus, beets, carrots, celery,

parsnips, potatoes, salsify, etc., in the vegetable garden. Early in the season it did some damage to strawberry and currant blossoms. This is a true bug and, like all the other members of the order, obtains its food by piercing the tissues of the plant it attacks and sucking out the juices. The adult insects (fig. 5) are about a quarter of an inch in length and vary in colour from yellowish-green to a dark brown. It may easily be recognized by the yellowish lines on the thorax and the yellow V-shaped mark just behind them on the scutellum. Choice plants may be protected by dusting with Pyrethrum insect powder mixed with three or four times its weight of flour and applied in early morning when the insects are sluggish and the foliage is moist with dew. On a larger scale kerosene emulsion or a decoction of tobacco may be used with advantage, if applied early in the morning before the bugs become too lively.

The two species of Asparagus Beetles, the Blue (*Crioceris asparagi*) and the 12-spotted (*C. 12-punctatus*) were very abundant all through the season, and were to be found on the plants as late as the end of September. Until last year the latter species alone was to be found, but now the Blue Beetle (fig. 6) has caught up to it here on its spreading movement northward and westward. Both species have no doubt come to stay, and it is a pest that will have to be reckoned with by asparagus growers from now onward, just as we have the Colorado potato-beetle always with us. In spring when the shoots are being cut for table use, the beetles may be kept off by dusting with lime; later on, when the plants have grown large, the larvæ of the Blue species will be found feeding upon the foliage and may then be destroyed by dusting with a mixture of Paris Green and lime, or with flour instead of lime, which is often difficult to procure. These larvæ are somewhat slug-like in shape and are of a greenish colour. The larvæ of the other species, the 12-spotted, feed upon the seeds of the asparagus plant and live inside the round pods. They cannot, therefore, be treated with poisons, but may be got rid of by cutting down and burning all the seed-bearing plants as soon as the pods have attained their full size and are beginning to turn red.



FIG. 7.—The Blue Asparagus Beetle. Enlarged 8 times. (After Chittenden, U. S. Dept. Agric.)



FIG. 8.—The 12-Spotted Asparagus Beetle. Enlarged 8 times. After Chittenden, U.S. Dept. Agric.)

Both beetles are often to be found on the same plant and may easily be recognized, one (fig. 8) being of a reddish-orange colour with 12 round black spots on the wing covers; the other (fig. 7) is of a shining blue-black colour with white blotches on the wing-covers. These vary a good deal in size and shape and sometimes form a cross of the ground colour on the back. They pass the winter in the adult state and are ready to attack the asparagus shoots



as soon as they appear above ground in the spring. Like many other hibernating insects, they take shelter under rubbish, and thus afford another argument for clearing up and burning all garden refuse in the autumn.

The Parsnip Borer (*Depressaria heracliana*, De Geer) is an old enemy, though not a very common one, of the second years' growth of parsnips, both cultivated and wild. This year it proved injurious to some plants in the College garden. The full-grown caterpillar is about three-quarters of an inch in length, of a dirty green colour above and yellowish on the sides and beneath, with a number of shining black warts on nearly all the segments. The young larvæ first attack the large umbels of flowers, covering them with a web, which is rendered very unsightly with masses of excrement. When the flowers have been all devoured, they burrow into the hollow stems, usually entering at the axils of the leaves and there feed upon the soft, white lining. If, however, there should be young parsnip plants near by, some of the larvæ are apt to attack them and eat up the tender foliage. By the middle of July they begin to turn into the chrysalis state and the small moths appear in August after a fortnight spent as pupæ. This year the first moths in captivity came out on August 15th, but we have sometimes had them as early as the 1st of the month. The moths are dull gray, varied with black scales and blotches, and have a flattened abdomen with projecting scales at the sides. They have a habit, like some others of the genus, of coming into houses and secreting themselves behind curtains and in garments, and are consequently mistaken for clothes moths. A full description of the insect in all its stages is given in the *Canadian Entomologist*, vol II., pp. 1-4, 1870. The only remedy for the attack seems to be the cutting off and burning all the infested flowers and stems.

Among the familiar insects against which the gardener has to contend every year, may be mentioned the Zebra Caterpillar (*Mamestra picta*), which was found devouring the foliage of beets, in addition to its usual attacks upon cabbage, turnips and other plants.

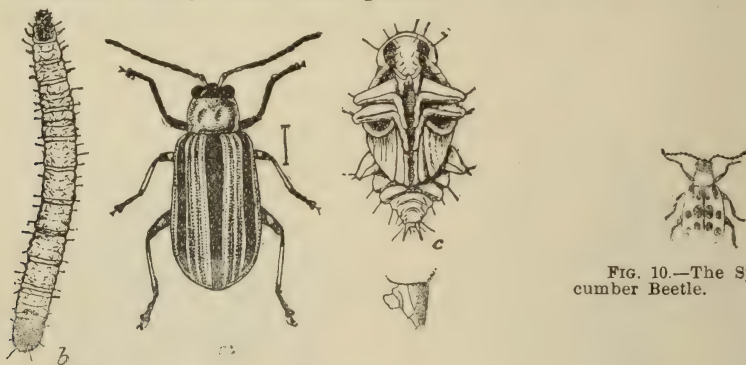


FIG. 9.—The Striped Cucumber Beetle: *a* beetle, *b* larva, *c* pupa. Enlarged 8 times. (After Chittenden, U. S. Dept. Agric.)

FIG. 10.—The Spotted Cucumber Beetle.

The Striped Cucumber-beetle (*Diabrotica vittata*)—fig. 9—and the spotted species (*D. 12-punctata*)—fig. 10—were both abundant during the later part of the summer in the blossoms of pumpkins and squashes; this was the second brood, the adults of which pass the winter as beetles, and are ready to attack young plants of the cucurbitaceous family as soon as they appear above ground in the spring. The second brood, though numerous, does no appreciable damage in the summer and autumn, as the plants are then so large and vigorous that the attack is unnoticed.

The root and stalk borers (*Gortyna nitela*—fig. 11—and *cataphracta*) were much complained of this year. The former was found in potato stems, and the latter was reported by Mr. C. W. Nash, of Toronto, as attacking all kinds of perennial plants in gardens, and also corn and tomatoes. It is difficult to prescribe any remedy for these insects, as they work out of sight and their presence is not suspected till they have seriously injured the plant.

Attacks by various species of Plant-lice (*Aphis*) were complained of in different parts of the Province; on Brussels-sprouts, for instance, at Stratford; on turnips at Grenfel; on hops at Shelburne; on sweet-peas at Penetanguishene; on honeysuckle at Toronto, etc. The ordinary remedies of spraying with kerosene emulsion or whale-oil soap wash have usually proved effective.

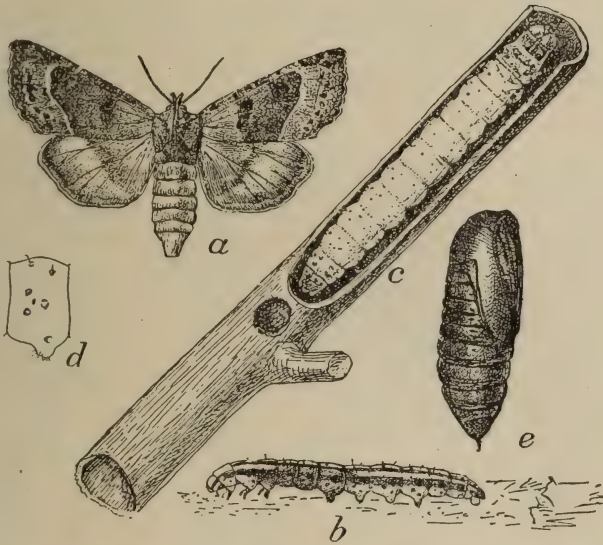


FIG. 11.—The Root and Stalk Borer (*Gortyna nitela*). a, female moth; b, half-grown larva; c, mature larva in injured stalk; d, lateral view of abdominal segment of same; e, pupa—all somewhat enlarged. (After Chittenden, U.S. Dept. Agriculture).

The Turnip Maggot (*Phorbia brassicæ*) was seriously injurious at Markdale, and the Onion Maggot (*Phorbia ceparum*) at Woodstock. For these underground insects there has not yet been found any perfectly effective remedy. In the case of the species attacking onions, it is recommended to dust the rows of plants with white hellebore once a week from the time that the young plants appear above ground; later on, when the bulbs are forming, the earth may be removed down to the roots and the exposed part dusted with white hellebore. The attack on turnips is not usually very severe, but the same species is liable to injure cabbages and radishes. It may be dealt with by spraying with a carbolic wash made of one quart of soft soap (or one pound of hard soap) in a gallon of water with half a pint of crude carbolic acid; this mixture should be boiled for a few minutes and when required for use, diluted with fifty parts of water to each one of the mixture. The application should be made once a week to the growing plants until the danger of attack is over.

Cut-worms and Wire-worms have given trouble in many places; at Mount Charles the Colorado Potato-beetle attacked and did considerable



damage to tomato plants. Cabbage-worms (*Pieris rapæ*) were very abundant this year, and were especially injurious to cabbages and Brussels sprouts, as well as to mignonette and nasturtiums in the flower garden.

White-grubs, the larvæ of May-beetles or "June-bugs" (*Lachnosterna*)—fig. 12—caused much damage to the roots of strawberry plants at Wallace, and were grievously complained of in consequence of their injury to lawns and golf-links at London, Woodstock, Paris, Watford, Durham, Coldstream and elsewhere. In the case of lawns and boulevards in cities and towns, where the affected area is not very large, spraying liberally with kerosene emulsion and washing it in with plenty of water, has been found somewhat effective. When the roots of the grass are so devoured that the turf will roll up like a carpet, which was the case in some places, it seems as if the only plan would be to remove a few inches of the soil beneath the sod containing the grubs, and then to replace with fresh earth and resod. In an enclosed garden poultry may be turned in to devour the grubs; robins and other birds render useful assistance also. Where the attack is on golf links, it would be found serviceable to enclose the infested spots with hurdles

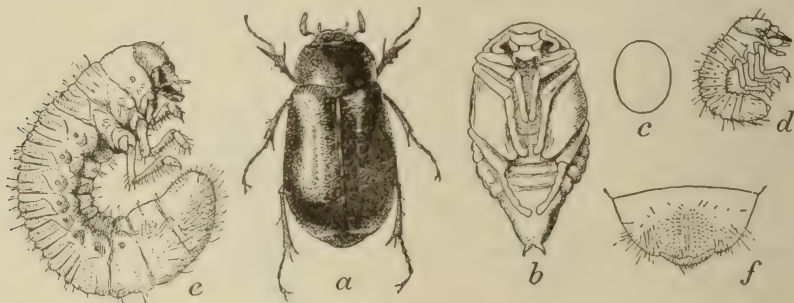


FIG. 12.—May Beetle: *a*, beetle; *b*, pupa; *c*, larva (White Grub)—slightly enlarged. (Chittenden, Bull. 19, n.s. Div. of Ent., U.S. Dept. of Agr.

and turn in a few pigs; these would soon root up and devour the grubs and could then be removed to another place. The parts of the field thus treated might then be levelled and resodded or sown with grass-seed. In ordinary cases the grubs thrive in old pastures, where they live underground for two or three years. A proper rotation of crops and the breaking up of all such fields is by far the most effective method of dealing with the insect. When the beetles are flying in May and June and doing much injury to the buds and foliage of trees and shrubs, spraying with Paris Green will kill large numbers; they can also be attracted by lights and destroyed. Boys also might be employed to gather them in early evening, and to search for them in their hiding places beneath the soil, along fences and against buildings.



FIG. 13.—Red-legged Locust.

While referring to pasture lands it may be mentioned that the Red-legged Locust (*Caloptenus femur-rubrum*)—fig. 13—was more than usually abundant this year throughout western Ontario and consumed a considerable amount of grass and cereals.

## FRUIT-TREE INSECTS.

The Oyster-shell Scale, or Bark-louse as it is usually called, (*Lepidosaphes ulmi*) is now wide-spread on apple-trees all over Ontario and has become through neglect a serious injury. Twigs completely encrusted with the scales have been sent in from many places, our correspondents fearing that they had to deal with the dreaded San José scale. On the College trees the lime-sulphur wash has been found thoroughly effective. When properly made and carefully applied in early spring, before the buds begin to swell, it completely removed the scales and left the trees clean; at the same time it destroyed other insects which attack the buds. In previous reports full descriptions have been given of the methods of making the wash and the proportions of the ingredients, it is unnecessary therefore to repeat them here.

The Rose-chafer (fig. 14), or Rose-beetle (*Macrodactylus subspinosus*) has been remarkably abundant this year. Specimens have been sent or brought to me from Toronto on the east, to the County of Essex on the west, but none from localities east of Toronto. In the Niagara District and here

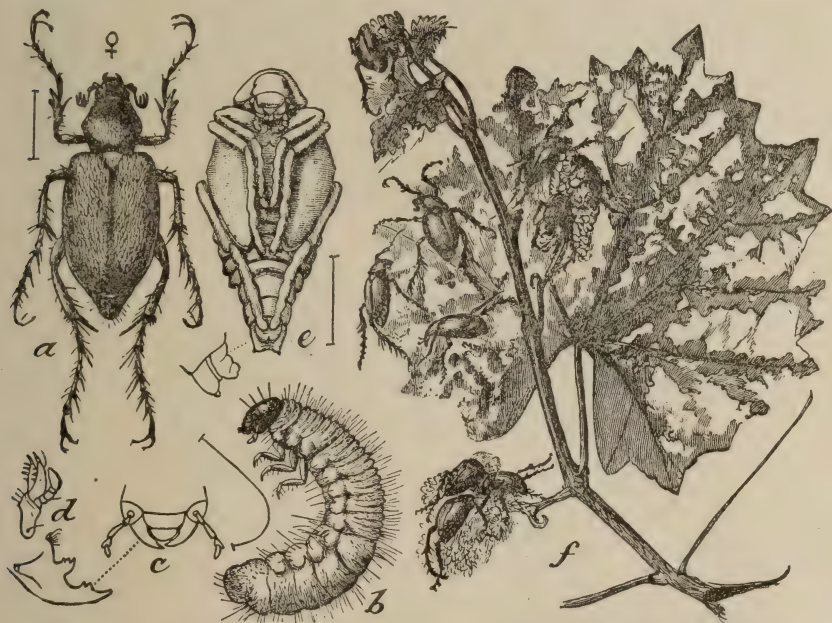


FIG. 14.—Rose Chafer (*Macrodactylus subspinosus*). a, beetle; b, larva; c and d, mouth-parts of same; e, pupa; injury to leaves and blossoms with beetles, natural size, at work. (After Marlatt, U.S. Dept. Agriculture.)

and there in the counties bordering on Lake Erie, the insect was especially abundant. In the neighborhood of London it has been prevalent for some years, but does not seem to extend much to the northward of the region referred to. There are, however, isolated occurrences in other parts of the Province recorded, as an example of which may be mentioned a severe attack upon young corn in the County of Grey last year.

The following is an account of the insect furnished by the writer to the *Toronto Globe* in July last, which may be repeated here:—

This destructive insect is called the Rose-beetle, from its attacks upon the buds and full-blown flowers of roses, which it burrows into and devours, but it by no means confines its attention to this plant. It is especially in-



jurious to the blossoms of the grape, upon which it clusters in great numbers and soon destroys all possibility of fruit, and it attacks the blossoms of fruit trees, large and small, ornamental shrubs, flowers, and in fact almost any kind of vegetable growth. It appears in immense numbers, and covers the plants that are attacked with a sprawling mass of beetles, full of alarm to the careful gardener and anxious grower.

The beetle is pale brown or drab in color, about a quarter of an inch in length, and with very long, spiny legs. The early stages of the insect are passed underground in sandy meadow land, where as a grub it feeds upon the roots of grasses and other plants. The eggs are laid by the female beetles in the ground during June and July, and the grubs become full-grown before winter; in the spring they turn into the pupa (or chrysalis) state, and come out as winged beetles in June. For about five weeks in June and July they abound, and then suddenly disappear, having completed their life course, not to be seen again till the following summer. Happily there is only one brood in the year.

It is a remarkable fact that the ordinary insecticides have little or no effect upon this pest, and it will eat blossoms sprayed with Paris green and thrive upon them. Many experiments have been tried, and it is found that, where the work is to be done on a large scale the congregated insects may be repelled by a wash made by adding about three pecks of freshly-slaked lime to a quart of crude carbolic acid in fifty gallons of water. This does not kill the insects, but the smell of the carbolic drives them away.

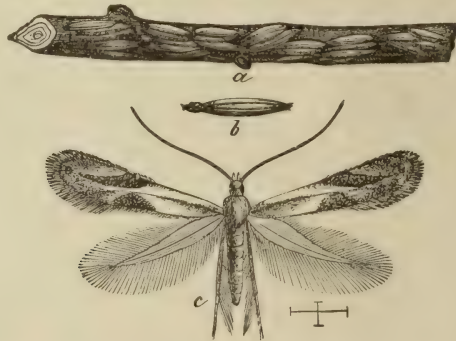


FIG. 15.—The Apple Bucculatrix. a, cocoons on twig; b, single cocoon; c, moth, greatly enlarged.

Another method is to spray the masses of beetles with half a pound of fish-oil soap in a gallon of water. It is claimed that this will kill about 95 per cent. of the insects. It acts by closing up their breathing apparatus and causing death by suffocation. On a small scale much may be done by beating the insects, in the early morning when they are sluggish, into pans containing a little coal oil and then burning them; or they may be knocked off into an open umbrella and then destroyed. Choice grapes or plants may be protected with netting.

It is now, however, almost too late to do much this season, as the destructive period of their lives is nearly over, but measures should be taken to prevent the recurrence of the pest next year. This can be done to a large extent by breaking up all the sandy meadows or old pastures in the neighborhood where the insects occur and putting in some crop instead. They do not breed in clay land, but in sandy soil, especially where it is damp from want of drainage. In this case, as in many others, the destructive insect has not much chance of appearing in injurious numbers if clean, scientific farming is carried out with a proper rotation of crops.

The large caterpillars of the Cecropia Emperor Moth were remarkably abundant this year on apple and crab trees at London, Brantford and Guelph. Being so large and voracious they consume the foliage very rapidly and soon strip a branch of its leaves. In Toronto Mr. Nash found it in considerable numbers on spiræa, as many as a dozen being seen on one bush in August. This handsome insect cannot be classed amongst our noxious species, as it rarely occurs in any numbers, being kept in check by its parasitic enemies; the cocoons in winter are also attacked by woodpeckers, who perforate the silken wrappings and suck out the liquid contents of the chrysalis.

Among other insects affecting the apple may be mentioned the Common Eye-spotted Bud-moth (*Tmetocera ocellana*) which we always have with us. The Apple Bucculatrix (*B. pomifoliella*)—fig. 15—mining the leaves, was

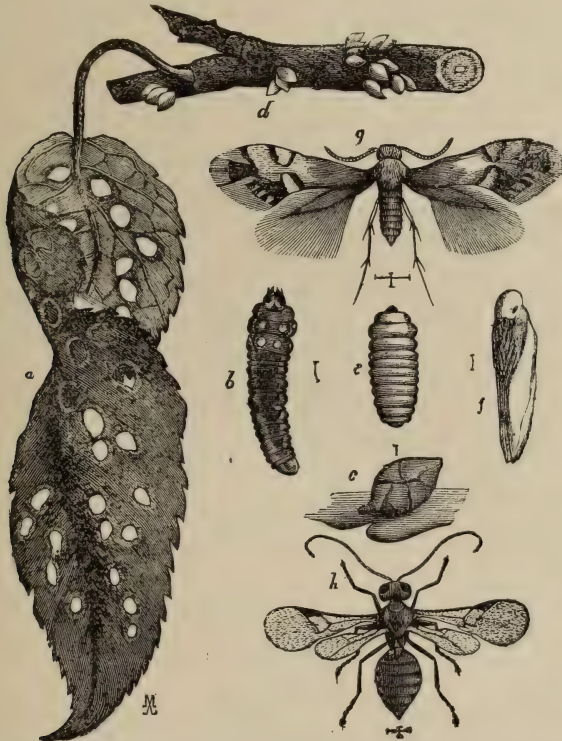


FIG. 16.—The Resplendent Shield-bearer. *a*, leaf showing holes made by insect; *b*, caterpillar; *c*, case; *d*, cases on twig; *e*, chrysalis; *f*, moth; *g*, parasitic fly.

abundant on some trees; its narrow, white cocoons were found in numbers on the twigs where the tiny caterpillars had attacked the foliage; at St. Catharines it occurred in injurious numbers.

An unusual attack upon the foliage of Quince trees was reported by Mr. Alister McKay, of Chatham. Large numbers of the leaves were found to be riddled with roundish holes in September, and in October the singular flat oval cases containing the chrysalids were to be seen in numbers attached to the leaves and to boards standing on end near the trees. The parent insect is a very beautiful minute moth called the Resplendent Shield-bearer (*Aspidisca splendoriferella*) which comes from the cocoons in May. The accompanying illustration (fig. 16) shows the insect in its various stages;



the moth is richly decorated with gold and silver streaks on its wings. The lime-sulphur treatment would no doubt clear the trees of these small cocoons and put an end to the attack.

#### SHADE-TREE INSECTS.

The Tussock Moth, which has been so often referred to and described in our Annual Reports, has continued its depredations on the shade trees of Toronto and some other places. It seems extraordinary that effective methods of control have not been adopted by those who have charge of the city parks and avenues. The remedy is simple, easy and effective and should not be very costly. It is only necessary to have the white egg-masses removed from the trees during the winter and destroyed by burning; this will get rid of the following season's crop of caterpillars. Trees once cleared, unless their boughs interlace with others that have not been attended to, will not be affected again for many years, as the female moths are wingless and they cannot travel any distance. Any cocoons that do not bear an egg-mass should not be interfered with as, if not empty, they contain either useful parasites or the chrysalids of the harmless males.

The Cottony Maple-scale (*Pulvinaria innumerabilis*) which has been excessively abundant on the shade trees in the streets of London for several years, and has also spread to vines and creepers, has at length begun to wane. During the past summer there was a very evident diminution in its numbers, so much so that it was hardly noticeable in some parts of the city and has ceased to excite alarm.

It is reasonable to expect, from past experience, that the insect will not be troublesome for some years to come, owing no doubt to the check it has received from useful parasites and unfavorable atmospheric conditions. At Guelph twigs were found this summer covered with the scales, but on examination it proved that not even one per cent. of them were alive; the rest were all dead and in many cases there was a hole in the scale through which the parasite had emerged. A similar condition was found in specimens sent from St. Mary's and Fergus.

The Black-banded Scale (*Eulecanium nigrofasciatum*, Perg.), called also the Terrapin Scale from its turtle-like shape, was found in great abundance on a maple tree near St. Catharines. Though not a common insect in Canada, it might easily become an injurious pest as it also attacks plum, peach, apple, linden, birch and several other trees. The affected tree was to be cut down and burnt in order to prevent any danger of the spread of the insect to the neighboring fruit orchards.

Another attack upon Maples of an interesting character was reported by Mr. Donald Fisher, of Vittoria, in September. The insect was the Maple-leaf Cutter (*Incurvaria acerifoliella*) which, in the caterpillar stage, cuts out round pieces of the leaves and forms with them a case in which it lives and hides. When in the case it feeds upon the leaf all round its dwelling and thus marks it with a series of blotches forming a circle on the surface of the leaf; when it has completed the circle in one place it moves to another on the same leaf and repeats the operation, till the leaf is covered more or less thickly with these round and conspicuous blotches. When the caterpillars are fully grown, the cases fall to the ground and the chrysalis stage is entered upon. There they remain all winter beneath the trees, and in the following May the tiny moths appear, pretty creatures with long, narrow pointed wings, the front pair steel-blue and the hinder ones smoky brown with a purplish reflection; on top of the head there is a tuft of bright orange hairs. These insects are sometimes numerous enough to completely defoliate

the maple trees they attack; but they are rarely to be found in numbers two years running, and as they work late in summer they do not injure the trees very much, the leaves having by that time nearly completed the discharge of their functions. If found to be necessary, a simple remedy would be to rake up the leaves, including the cases, under the trees and burn them on the spot. Dr. Fletcher, in his Report for 1885, records an attack by this insect on maple trees in the neighborhood of Ottawa, and also relates a similar visitation in Missisquoi County, P. Que., described by the Rev. Dr. Fyles in the year 1881.

The Spruce Gall-louse (*Chermes abietis*) Fig. 17, has become a serious enemy to spruce trees and is causing much trouble and anxiety to the growers of these ornamental trees in many parts of the Province. It is very abundant at Guelph, Galt, Minden, Chatham and various other places. As it has frequently been described and referred to in these Annual Reports, it



FIG. 17.—Spruce Gall-louse. a, summer form of nymph; b, affected twig.

may suffice to mention now that good results have been obtained by spraying affected trees at the time the young plant-lice are exposed with a tobacco and soap wash or with kerosene emulsion. This should be done in May when the young lice emerge from the eggs and before they are enclosed in the galls, and also towards the end of August when the winged forms come out of the galls. The terminal shoots should be watched at those times and the spraying performed as soon as any of the insects are to be seen moving about. They are so minute that a magnifying glass will be required to see them. The spraying should be repeated two or three times at short intervals, as the insects do not all come out at the same time.

The Larch Saw-fly (*Nematus Erichsonii*) is still to be found here in a small plantation on the College premises. Towards the end of July full-grown larvae were found, which assumed the chrysalis stage a few days after they were collected (July 23). There had evidently been a serious attack in the spring, as nearly all the boughs had a very short and scanty clothing of light green foliage, contrasting strongly with the deeper hued and much longer needles on the branches that had not been defoliated. The ground



beneath the trees was covered with the old droppings from the caterpillars. This plantation has been repeatedly sprayed in previous years, but the insect is very far from being exterminated. Its ravages in the Province of Quebec are graphically described by Dr. Fyles in another part of this Report.

Spittle insects (*Aphrophora*) were abundant this summer on some Scotch Firs and also upon grass in pasture fields—no doubt different species. The masses of white froth, resembling spittle, were very conspicuous, each one containing the strange larva which produces it. The adult bugs were to be found in numbers on the Fir trees later in the summer. No serious damage was done in either case, though no doubt an extensive attack must reduce the vitality of a tree, and in a pasture the presence of the frothy masses would be very distasteful to the feeding cattle.

The Fall Web-worm was very abundant again this year. It is so conspicuous and so easily got rid of, a whole colony at a time, that there is surely no excuse for its increase and prevalence. The very unsightliness of the webs, with their foul masses of excrement and cast-off caterpillar skins, ought to be enough to cause every one with a spark of tidiness in his composition to clear at least his own trees and induce his neighbors to follow his example.

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### INSECT GALLS OF ONTARIO.\*

By TENNYSON D. JARVIS, ONTARIO AGRICULTURAL COLLEGE, GUELPH

I am under obligations to numerous friends and correspondents who have aided me in this work. I am especially indebted to Mr. W. R. Thompson, O. A. College, for the assistance he has rendered in the preparation of this work. I am under obligations to the Department of Entomology, Washington, D.C., Dr. Bethune, Dr. Fletcher, Prof. Lochhead, Mr. J. Eaton Howitt, Mr. C. W. Nash and Mr. Douglas Weir for the assistance they have given me.

Among the many curious phases of insect life, and among the many wonderful illustrations of the effects of evolution upon organized structures with which we meet in the study of entomology, there are few examples which present such varied and interesting peculiarities of structure and development as do insect galls. Varying as they do from such simple malformations as the curled leaves produced by the work of aphids to such beautiful and complex structures as the oak-apples and oak twig-galls, they present a succession of types which show in a peculiar and wonderful manner the changes in structure of insect and plant induced in the struggle for existence. A gall may be briefly defined as a malformation of plant tissue induced by mechanical or chemical stimulus or by some other unknown cause. These are sometimes produced by fungus, but those with which we have to deal are produced in different ways by the work of insects. The habit of gall-making seems to have arisen at different times and in entirely different orders and families of insects, and even a branch of the order Acarina has acquired this gall-making habit. In each case, however, it has developed along lines which depend directly upon the structure of the insect, so that in many cases the classification of the insect can be considerably simplified by an examination of the gall. For instance, the Cecidomyiid, having an ovipositor incapable of piercing, lays its eggs upon the surface of the leaf,

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\*See plates at beginning of volume.

and the gall thus induced by the work of the larva is generally open; while the Cynipid, having a stinging ovipositor, deposits its eggs in the leaf tissue through a minute puncture, which, quickly healing, leaves the gall closed and the insect at maturity emerges through a hole which it cuts in the gall, which the Cecidomyiid, on account of its sucking mouth parts, is utterly unable to do. Here, moreover, we have an explanation of the apparently contradictory fact that Cecidomyiid galls are sometimes closed, because whenever we find this condition we invariably find the gall splitting open at maturity. The reason for this in all probability is that the larva entering the tissues makes a much larger incision than the minute puncture induced by a Cynipid's ovipositor, and this, never completely healing, splits open when the tissues commence to dry up in autumn. Similarly in other orders the structure of the gall-maker determines the form of the gall.

These abnormal growths have long been noticed and commented upon. The earliest authentic work upon the subject was by Malpighi. In 1686 he published his "De Gallis," containing descriptions of a number of galls common to Italy and Sicily. In America the subject was first taken up by Osten Sacken, Walsh, Basset, Riley, Harris, and a few others who have laid the foundations for most of our work on galls. Now a large number of writers, among whom may be mentioned Ashmead in Hymenoptera, Pergande in Hemiptera, Garman in Phytoptidae and Norton in Nematinae. A host of European writers have also taken up the subject, but in this country there still remains an enormous amount of work to be done even in classification, while the morphology and histology is practically an unexplored territory.

The insects producing galls are confined principally to four orders, the Acarina, which are not true insects but mites, the Diptera or flies, the Hemiptera or bugs, and the Hymenoptera including two families, the Tenthredinidae and Cynipidae, and to a slight extent the Chalcididae. It is a curious fact that the insects which are of the most developed and specialized structure, produce the most complex galls. That is, in the lower orders, as Thysanura, the orders formerly included in Neuroptera, Orthoptera, and other orders, we find no gall-making habits; while in the Diptera, Hemiptera and Hymenoptera, and to a slight extent in the Lepidoptera and Coleoptera we find the habit developed. This curious coincidence may be possibly explained thus—if, indeed, the lower and less specialized forms which came into existence in an earlier age when a lower and now extinct type of vegetation flourished, ever produced forms with the habit of gall-making, these forms probably perished with the flora of that age, while the later forms which now produce galls were evolved at a much later period when the flora resembled that of the present age.

The orders of insects among which we find the greatest number of gall-producing insects are the Hemiptera, Diptera and Hymenoptera, and to some extent the Coleoptera and the Lepidoptera. The order Acarina in the class Arachnida contains the family Eriophyidae or gall-mites. These are also specialized forms, inasmuch as acaralogists seem to be unable to agree upon their relationship to other Acarina.

#### *Acarina.*

##### Family Eriophyidae, Gall-Mites.

This is a family of microscopic mites which are quite curious and unusual in structure. They have only two pairs of legs and the abdomen is long and striated. These striations, which differ in the different species, and differ in number on the dorsal and ventral surfaces, are of considerable



value in classification. The galls produced vary in form, but are always open or provided with an opening through which the mites pass in and out. They are generally lined with minute hairs or granules, and are quite simple in structure. Reproduction takes place within the gall.

### *Coleoptera.*

Family, Buprestidae. Metallic Wood Borers.

This is a family of the beetles containing insects whose larva bore in wood of trees and shrubs. A few produce galls, the most important one being the Red-necked *Agrilus* producing galls upon the Raspberry and Blackberry canes.

### *Lepidoptera.*

Super-family, Tineidae. Leaf miners and clothes moths.

This family is very large and the larvae are mostly plant feeders. The adults are minute moths with narrow wings bordered with wide fringes. The family contains but few gall-makers.

### *Hemiptera.*

Family, Aphididae. Aphids or plant lice.

These are small, soft bodied insects which suck up the juices of plants and which often produce galls. There are winged and wingless forms, the wingless forms reproducing parthenogenetically. The galls produced vary in form from mere leaf curls to forms of most curious appearance but of quite simple structure. They are all open or furnished with an opening, and large numbers of the aphids can be found if the gall is opened.

Family Psyllidae. Jumping plant lice.

The members of this family resemble the preceding to a great extent, but they are not so numerous. The hind legs are formed for jumping.

### *Diptera.*

Family, Cecidomyiidae. Gall gnats.

These insects in the adult stage are rarely seen. They are very delicate, small, two-winged flies and with few veins in the wings and with sucking mouth parts. The eggs are laid upon the leaf surface and the larva either feeds there, making an open gall, or makes an incision in the leaf and enters, forming a closed gall, which splits open at maturity at the point where the larva entered. The larvæ can generally be readily identified by their color, which is orange, red or pink, and by the development between the second and third segments of the body of a peculiar horny projection called the breast-plate, the use of which is not definitely known.

Sub-family, Trypetinae.

These flies are much larger than the preceding, but few of them produce galls. Two species, *Trypeta polita* and *Trypeta solidaginis*, produce galls upon the goldenrod. The adults are pretty flies with banded wings.

### *Hymenoptera.*

Family, Tenthredinidae.

In this family the Nematinae produce galls. The head and thorax are wide. The base of the abdomen is broadly joined to the thorax, and the abdomen of the females is furnished with a pair of saws. The larvae have from twelve to sixteen prolegs. These insects have been very thoroughly taken up by Norton in his monograph on Nematinae. A large number make galls on Willows.

### Family, Cynipidae. Gall flies.

This is a family of very minute, four-winged insects. In the adult gall fly the abdomen is unusually compressed and joined to the thorax by a short peduncle, the first abdominal segment. The first segment is large and the remaining ones are short and each is more or less covered by the preceding. The ovipositor is long and slender. The insect deposits its eggs within the tissues of the plant by piercing it with its ovipositor. The wings have few veins and the fore-wings lack the stigma. The galls produced are closed and the insect emerges at maturity through a hole which it cuts in the gall. One of the most interesting features of insect life that has been discovered was noticed by Bassett and confirmed by Adler in regard to these insects. By careful investigation he discovered that two generations of these insects were produced every year, each of which produced a different sort of gall, and which could not be recognized as the same species. There is still, however, an enormous amount of work to be done upon this subject in America.

### ERIOPHYIDAE.

*Eriophyes quadripes*. Produces top-shaped galls on the upper surface of the leaves of soft Maple. The galls are greenish at first, then become red, or purplish and finally dark brown. In the younger galls the inside wall is fairly smooth and the interior is hollow. As the galls grow older, irregular and somewhat granular excrescences appear on the interior wall and grow toward the centre until in the older specimens the interior may become quite full. It occurs on Soft Maple (*Acer dasycarpum*). Very common.

*Eriophyes acericola*. The mature galls are green and resemble in form and position the summer cases of the cigar-case-bearer. The interior wall is granular and parallel excrescences are found, but even at maturity they do not extend to the centre of the interior as in the case of *E. quadripes*. Occurs on Hard Maple (*Acer saccharum*). Very common.

*Eriophyes abnormis*. Produces balloon-shaped galls on the upper surface of the leaf. The apex of the gall is usually serrated. The interior has ridges projecting inward and the folds in the old galls nearly fill the cavity. Occurs on Basswood (*Tilia Americana*). Very common.

*Eriophyes ulmi*. The galls are intermediate in form between those of the Hard and Soft Maples and somewhat balloon-shaped. The interior wall is ridged vertically. The galls usually occur on the upper side of the leaves. Occurs on Soft Elm (*Ulmus Americana*) and Rock Elm (*Ulmus Racemosa*). Very common.

*Eriophyes sp.* Produces irregular wart-like swellings on the upper surface of the leaves of the Manitoba Maple. The swellings are green at first but turn gray when mature. The average diameter of the gall is about 3 m.m. The under surface of the galls appears as irregular concavities lined with a granular secretion, which is greenish at first and rusty brown when old. Occurs on Manitoba Maple (*Acer negundo*). Common.

*Eriophyes phloeoptes*. Produce tubercular gall masses which encircle the base of the buds and shoots of the cultivated plum. The galls are about one-sixteenth of an inch in diameter, and the interior is granular with a small cavity in the centre. As many as sixty-two of these mites were found in a single gall. Occurs on cultivated Plum (*Prunus domestica*). Not common.

*Eriophyes sp.* This species produces an abnormal growth of the buds of the Yellow Birch. The terminal growth of the twig is checked and large bunches of buds are formed sometimes as large as a hen's egg. The galls remain on the tree, giving the tree an unsightly appearance in winter. Occurs on Yellow Birch (*Betula lutea*.) Common.



*Eriophyes pyri*. Produces blister-like swellings on the leaves of the Pear and Apple. The blisters are reddish brown in May, green in June, and dark brown or black in the latter part of June. The blisters usually run together, forming irregular blotches over the upper surface of the leaf. Occurs on Pear (*Pyrus communis*) and Apple (*Pyrus malus*). Very common.

*Eriophyes sp.* This gall is green and red and about 2 c.m. in length. It consists of a fold of the leaf making a long, irregular, wavy projection on the upper surface of the leaf. From beneath this appears as a serpentine incision in the leaf. It is about 2 m.m. high. It is hard and roughened on top. From the midrib to the edge of the leaf is the general direction of the gall. Occurs on Hawthorn (*Crataegus sp.*). Common.

*Eriophyes sp.* Produces galls about 2.5 m.m. in length by 1.5 m.m. broad. It is joined to the leaf by a constriction. Externally it is red and pubescent. Inside gall is full of granular material and contains numerous mites. Occurs on Speckled Alder (*Alnus incana*). Common, especially upon the leaves of the bushes at the water's edge.

*Eriophyes sp.* This mite produces galls of the typical Eriophyid shape upon the leaves of the Paper Birch. The galls are yellowish or reddish, joined to the leaf by a constricted neck and rather smaller than usual, being about 2 m.m. long by 1 m.m. broad. They appear on both upper and under sides of the leaf, and when found upon the under side, hairy. The opening on the opposite side through the leaf lined with white hairs.

Parasitic mites attack this species and often they are found to have devoured or driven out all of the gall makers. Occurs on the Paper Birch (*Betula papyrifera*). Common.

*Eriophyes salicola* Garman. The gall is irregular, roundish and serrated, with a roughened top, projects about 1.5 m.m. from the surface of the leaf, slightly constricted where it joins the leaf. From 1-4 m.m. in diameter. On the under side there is sometimes a small projection and sometimes a cup-like cavity in which are seen the roughened portions of the under side of the gall. When the gall is mature, it is filled with granular excrescences and hairs growing from the interior walls. The gall is green or red and distributed over the upper or lower surface of the leaf. Occurs on *Salix Alba*, *Salix balsamifera*, *Salix discolor*, *Salix rostrata*.

The description was taken from Galls on *Salix balsamifera*.

*Eriophyes sp.* This mite produces dimples on the leaves of the Aspen on the upper side lined with spherical granules, reddish or greenish in color. These consist of soft parenchymatous tissue upon which the mites feed. The galls are fairly uniform in size, being about 2 to 3 m.m. in diameter. The galls are green in color and occur three or four to a leaf. Occurs on Aspen (*Populus tremuloides*). Common.

*Eriophyes sp.* The galls consist of irregular projections on the upper or under side of the leaf and are quite generally distributed in patches, 4-5 m.m. in length or even 1.5 c.m. They project about 1-1.5 m.m. above the leaf. On the under side they appear as irregular cavities lined with white vegetable hairs. The galls are green in spring, turning red later in the season. Occurs on Poison Ivy (*Rhus toxicodendron*). Common.

*Eriophyes sp.* This gall consists of a small circular depression averaging about 2 m.m. in diameter and always depressed on the lower side of the leaf. On the upper side it appears as a green or red circular elevation. The gall is lined with minute spherical granules composed of soft parenchymatous tissue. Occurs on large-toothed Aspen (*Populus grandidentata*). Common.

*Eriophyes* sp. This gall is so different in structure from the typical *Eriophyes fraxini* gall that I have no hesitation in placing it as a different species. The galls are produced almost invariably along the principal veins. Dorsally they are light pinkish white in color, about 2.5 by .75 m.m. and growing on either side of the vein. The surface of the gall is transversely seamed and irregular. It lies in a one-sided position upon the leaf. Ventrally the galls appear as white, hairy projections following the veins. The opening runs the full length of the gall and is lined with white, hairy tissue. The mites are exceedingly numerous, more occurring to a gall than of any other species. They can easily be detected with a hand lens and are brown in color. The interior of the gall is lined with soft tissue. Occurs on White Ash (*Fraxinus Americana*). Not common.

*Eriophyes* sp. This gall is a pouch-like growth on the upper side of the leaf. It is distinguished from *E. serotinae* by the fact that it has not the funnel-like opening of that gall. It is green or reddish, about .5-.7 cm. in length and 3 m.m. in diameter at its widest part. Near the leaf it is constricted to about 2 m.m. in diameter. The interior of the gall is lined with small granules and among these the gall mites feed. The gall opens on the under side by a minute aperture about 1 m.m. in diameter lined with fine white hairs. Occurs on Chokecherry (*Prunus virginiana*). Common.

*Eriophyes* sp. Only one specimen of this gall was found. It is of the same type as the gall on Chokecherry, but rather longer and narrower. It is green in color and the inside is lined with rough juicy tissue. Only two mites were found in the gall, near the opening. Occurs on Wild Plum (*Prunus Americana*). Not common.

*Eriophyes querci*. This is an irregular dimple upon the blade of the leaf. It is of the same color as the leaf when young, but turns yellowish red with age. From beneath it appears as an irregular concavity, lined with a tangled mass of white vegetable hairs. Among these abnormal hairs are the mites, which feed upon the tissue and produce the gall. The gall is 3 to 5 m.m. in diameter. Occurs on Bur Oak (*Quercus macrocarpa*). Common.

*Eriophyes serotinae*. This gall is pouch-like. It occurs upon the upper side of the leaf with a deep funnel-like opening beneath. The gall is about .5-.6 cm. in length and consists of a pouch-like hollow growth on the upper side of the leaf constricted about half way to the leaf. The interior of the gall, which is green or red and green, is covered with minute granulations, which seem to be the food of the mites producing the gall. The distinguishing character of the gall is the deep funnel-like opening beneath lined with hair through which the mites pass in and out. Occurs on Black Cherry (*Prunus serotinae*). Common.

*Eriophyes* sp. The gall made by this species of *Eriophyes* consists of a small round swelling which protrudes very slightly on both sides of the leaf. This is about .5-1 m.m. in diameter, green in color in spring, and turning brown in summer and autumn. The galls are very numerous where they occur, and as many as 100 are sometimes found on a single leaf. The gall contains numerous mites, which feed in the irregular cavities in the gall. Occurs on the spotted Hawthorn (*Crataegus punctata*). Not common.

*Eriophyes* sp. Red patches are found upon the upper sides of the leaves of Maples, resembling hoar-frost. Under the microscope, it is seen to consist of minute pink balls, joined to the leaf by a constricted neck and occurring in such numbers as to appear like red frost. Occurs on Hard Maple (*Acer saccharum*). Common.



*Eriophyes sp.* It differs from the frost mites on Hard Maple and Beech in that it does not consist of a mass of spherical granules, but of a mass of tangled threads which under the lens are seen to be arranged in very beautiful star-like clusters. The mites are easily found among these. The patches are found on the under side of the leaves between the ribs. Occurs on Rock Elm (*Ulmus racemosa*). Common.

*Eriophyes sp.* The structure of this frost mite gall is much the same as that of the red frost mite, but the mass of excrescences is thicker, white in color and produced upon the under side of the leaf. Occurs on Hard Maple (*Acer saccharum*). Common.

*Eriophyes sp.* The gall consists of a mass of tangled white vegetable hairs. The growth is very much the same in general appearance as the one producing the "frost" and "down" on Rock Elm and Beech. The mites are quite small and difficult to locate, as they are much the same in color as their surroundings, and remain down in the lower part of the gall near the leaf. The gall is found on the lower side of the leaf, a common place is in the axils of the veins. Occurs on Mountain Maple (*Acer spicatum*). Common.

*Eriophyes sp.* The work of this mite is very commonly seen. It appears upon the leaves of Beech quite early in the season. The presence of the mite is shown by large irregular white masses on the under surface of the leaves which have a glittering appearance resembling hoar frost. Under a microscope, this appears as a mass of innumerable, minute, spherical granules. Among these are the mites, which are few and very difficult to locate. The upper surface of the leaves upon which the frost mite is working are discolored and in some cases distorted. Occurs on Beech (*Fagus sylvatica*). Very common.

*Eriophyes sp.* This consists of a mass of minute, yellowish, transparent, granular bodies upon the leaf, growing together in such numbers as to form large patches of frost running between the ribs, which hide the leaf. The patches vary from 1 cm.-3 cm. in length and from .25-1 cm. in diameter. Among these granules are the mites which are extremely minute, the smallest of all the mites yet examined. Occurs on Paper Birch (*Betula papyrifera*). Common.

*Eriophyes vitis.* These are typical Eriophyid galls about .5 cm. in length by 2.5 m.m. at the widest portion to 1 m.m. at the constricted portion near the leaf. The top of the gall is irregular, being much in appearance like *Eriophyes abnormis*. The interior and the entrance to the gall is lined with white vegetable hair. The galls are green in color and grow mostly upon the under sides of the leaves, with the opening upon the upper side. Occurs on Wild Grape (*Vitis cordifolia*). Not common.

*Eriophyes fraxini.* The galls produced by this species of mite are found upon several species of Ash, and vary somewhat in structure according to the leaf upon which they are found, upon Red Ash being hairy, upon White Ash glabrous, etc. They consist of somewhat irregular circular swellings from 2-4 m.m. in diameter which protrude upon both sides of the leaf. Sometimes they occur only 10 to a leaf, but sometimes as many as 75 are found, entirely covering the surface of the leaf and so interfering with its functions as to injure the tree upon which the galls occur. The surface of the galls is rough. Several often unite, to form a large irregular patch. On the under side are the minute, hairy-lined openings into the galls. The galls are hollow, thick-walled, and lined with numerous granular excrescences and irregular growths. The gall is of a lighter green than the rest of the leaf. Occurs upon White Ash (*Fraxinus americana*) and Red Ash (*Fraxinus pubescens*). Common.

*Eriophyes* sp. This is one of the "frosts" produced by the work of the mite upon the leaves. The patches of frost are pure white in color, and occur on the under side of the leaves, in the axils of the veins. Under the microscope, these patches of "frost" appear as dense masses of thick transparently white hairs. The patches vary in size from 4-10 m.m. On the leaves of *Alnus incana*. Not common.

*Eriophyes* sp. This consists of a dense mat of brown hairs growing in large patches upon the under sides of the leaves. Above, the leaf appears lighter in color and rather abnormally shiny where the gall mites are working beneath. On *Quercus coccinea*. Common.

*Eriophyes* sp. Circular, flat, or slightly convex patches varying from 2-3 m.m. in diameter on the upper side of the leaf, the under side being covered with minute granular excrescences, which vary from white to dark brown in color. On *Populus grandidentata*. Common.

*Eriophyes* sp. Irregular patches of frost, transparently white in color and appearing as a mass of minute granules. Under the microscope similar to the frost upon the Beech and Maple. Occurring upon the surface of the leaves. Occurring upon the leaves of the Low Birch (*Betula pumila*). Uncommon.

*Eriophyes* sp. Similar to the above but rosy pink in color, and occurring in much larger patches, upon the upper side of the leaves. On *Betula lenta*. Common.

*Eriophyes* sp. These galls are produced upon the Soft Elm, and when young bear some resemblance to the typical mite gall of the Elm (*Eriophyes ulmi*), but the distinguishing peculiarity of these galls is that they grow until they reach a size far exceeding that of any *E. ulmi* yet observed, sometimes attaining a length of 2 by 1.5 cm. The development of the galls also differs from that of *E. ulmi*, which commences as a button with a constricted neck, while this gall often commences as a cone, or deep dimple. On Red Elm (*Ulmus pubescens*). Not common.

#### HEMIPTERA.

##### *Spruce Gall-louse (Chermes abietis).*

These galls are greenish swellings, occurring on the twigs of various species of Spruce and sometimes in immense numbers. The galls are polythalamous, containing from three to thirty cavities within each of which live twenty or thirty minute yellowish insects. In July the galls dry up, and the cavities open, allowing the lice to escape. These molt and some of them assume wings. This gall-louse is one of the worst pests of Spruce trees known. In many parts of Ontario nearly every tree is abundantly covered with this gall, and the insects do great damage by sucking the juices of the tree. Occurs on White, Black and Norway Spruce—*Picea alba*, *Picea nigra* and *Picea excelsa*. Very common.

##### *Vagabond Gall (Pemphigus vagabundus).*

Produces large irregular galls on the tips of the twigs. It is a monothalamous gall consisting of a double lamina, and between these two layers are large numbers of aphids. The gall usually remains on the tree over winter. Occurs on the Cottonwood (*Populus deltoides*). Common.

##### *Cockscomb Gall on Elm (Colopha ulmicola Fitch).*

A hollow, cockscomb, thin-walled gall on the leaf of the American Elm. Occurs on the upper side of the leaf. The apex of the gall is serrated and the sides grooved. The gall appears inflated. The opening is on the under side of the leaf, running the full length of the gall. The in-



terior contains numerous aphids in July and June. The gall is 1.5-2 cm. long by 1 cm. high. Occasionally a number occur on a leaf side by side. It is constricted near the base. Occurs on American Elm (*Ulmus Americana*). Common.

*Spiny Witch-Hazel Gall (Hormaphis spinosus).*

This gall is round, covered with long spines. It is a deformation of the fruit bud. The spines are covered with little clusters of hair like those on a cactus leaf. In it are many small aphids, brown in color. The opening to the gall is at the base, near the stem of the gall by which it is joined to the branch. Green in summer, woody and hard in winter. Occurs on Witch-Hazel (*Hamamelis virginiana*). Common.

*Witch-Hazel Cone Gall (Hormaphis hamamelidis).*

This gall is cone-shaped, about 5 m.m. in length by 3 m.m. in diameter. It occurs on the upper side of the leaves, with the opening through a small hole in a slightly projecting cone on the under side of the leaf. The opening is about 5 m.m. in diameter. The gall is hollow, containing numerous aphids which are white in color. Occurs on Witch-hazel (*Hamamelis virginiana*). Common.

*Poplar Stem Gall (Pemphigus populicaulis).*

An irregularly spherical gall developed at the junction of the petiole and blade of leaf. The opening is as wide as the gall and is at one side of the base of the pouch. It is hollow, about 11 m.m. in diameter, containing large numbers of aphids. Occurs on Cottonwood (*Populus deltoides*). Common.

*Hickory Cone Gall (Phylloxera Caryaefallax).*

This is a cone-shaped gall about 3 m.m. in diameter which occurs rather uncommonly on Hickory in this district. The gall is on the upper surface of the leaf, the opening being in a smaller cone upon the under surface. The gall is monothalamous, and contains numbers of small white aphids. It is green in color, and the opening is fringed with hairs. Occurs on Shell-Bark Hickory (*Carya alba*). Not common.

*Vein Gall on Hickory (Phylloxera caryaevenae).*

This gall consists of a fold of the main veins running from the midrib to the edge of the leaf. Above it is ribbed by the vein running along it. It is 5 m.m.-1 c.m. in length and 1-1.75 m.m. wide and 1.5-3 m.m. high. The galls are red. From the ventral side they appear as slits along the vein, lined with white thick hair. The gall is hollow and contains eggs, small aphids and a stem mother. The eggs are oval and transparently white and the gall is grooved inside, evidently for the purpose of holding them. The galls begin to appear in May, and are mostly empty by August. The larvae, according to Pergande, conceal themselves in cavities of the bark, or in deep depressions in the trunk and stem after leaving the gall, where they feed upon the juices of the tree. Occurs on Shell-Bark Hickory (*Carya alba*). Not common.

*Cottonwood Midrib Gall (Pemphigus sp.).*

A somewhat elongated pouch-like gall of aphid origin growing on the midrib of the leaf of the cottonwood, about halfway between the base and the apex of the leaf, and never on the leaf at the junction of the petiole and blade like *P. populicaulis*. Also instead of being irregular globular as is the latter, this gall is pouch-shaped, about 1-1.5 c.m. broad. Occurs on Cottonwood (*Populus deltoides*). Common.

*Hackberry Nipple Gall (Pachypsylla celtidis-mammae).*

A woody gall with bluntly rounded apex and slightly constricted at the point of attachment to the leaf. It is found on the underside of the leaf and opposite the gall is a concave depression. Occurs on Hackberry (*Celtis occidentalis*). Common.

*Hackberry Blister Gall (Pachypsylla celtidis-vesiculum).*

Circular spot-like galls on the under side of the leaf with a small nipple in the middle. Occurs on Hackberry (*Celtis occidentalis*). Common.

*Sumac Tomato Gall (Pemphigus rhois).*

Large, smooth, rounded galls, somewhat resembling a tomato in shape. Yellowish green in color and sometimes tinged with red. The interior is hollow and filled with lice. Occurs on Sumac (*Rhus typhina*). Common.

*Woolly Aphis Gall of Elm.*

The lice may be seen in large clusters on the trunk and branches of the tree. They suck the juices from the bark and cause knot-like swellings to appear. These galls sometimes attain a diameter of two or three inches. Occurs on many species of Elm (*Ulmus sp.*). The one from which this gall was described was a young American Elm (*Ulmus Americana*). Common.

*Woolly Aphis of Apple.*

This species of woolly aphis live in small colonies and produce small swellings on the young twigs. The galls often become twice the diameter of the stem upon which they are feeding. Occurs on Apple (*Pyrus malus*). Common.

*Grape Phylloxera (Phylloxera vastatrix).*

Small galls on either upper or lower surface of the leaf. Another generation of this insect forms galls upon the roots, and it is in this stage that it causes considerable destruction among the cultivated varieties. Occurs on wild and cultivated Grapes. Very common on Wild Grape (*Vitis vulpina*).

LEPIDOPTERA.

*Elliptical Goldenrod Gall (Gelechia gallaesolidaginis).*

A large elongated stem gall. It is about one inch in length and monothalamous. The larval chamber is quite large. It remains over winter in the pupal stage and the imago emerges in the spring. Occurs on Goldenrod (*Solidago sp.*). Common.

*The Locust-Twig Borer (Ecdytolopha insiticihana).*

Oval swellings on the branches and twigs, varying from 2-4 cm. in length and about a cm. in thickness. Generally occurring at the junction of the leaf petiole with the branch, about which point the wood is destroyed and a mass of castings and sawdust surrounds the hole entering the gall. The tunnel of the gall maker runs some distance, and at the bottom of it is a reddish-brown larva about half an inch in length with a light-brown head.

COLEOPTERA.

*Willow Branch Gall (Saperda concolor).*

Large, rough galls on the stems of the willow and cottonwood. The galls are smooth at first, but become rough later in the season. The affected portions are very weak and easily broken off by the wind. Occurs on Willows and Cottonwood. Common.



*Red-necked Blackberry-borer (Agrilus ruficollis).*

Symmetrical swellings of the Blackberry cane. The gall is about one-third greater in diameter than the normal cane. The larva makes a channel in the centre of the gall. Occurs on Blackberry. Not common.

DIPTERA.

*Vein Gall of Blue Beech (Cecidomyia pudibunda).*

This gall consists of a fold of the leaf along the veins. It is not very much thickened and is generally constricted near the leaf, forming a long, hollow tube. The opening to the gall is on the underside and runs the full length of the gall. It is lined with white pubescence in much the same way as the Phylloxera on Hickory. Inside the gall, which is hollow, are found a few very small orange-colored larvæ. The gall is quite red in color. Occurs on Blue Beech (*Carpinus Caroliniana*). Common.

*Ball Gall on Wood Nettle (Cecidomyia urnicola).*

This gall is somewhat similar in structure to the gall on the fruit of the wood nettle, but is much smaller, much lighter in color and uniformly monothalamous, whereas the gall on the fruit is sometimes polythalamous. The larvæ are also somewhat smaller than those on the fruit. The galls occur either on the upper or lower surface of the leaf. Numerous small inquiline Hymenoptera were hatched from this gall. There is no opening in the gall. Occurs on Wood Nettle (*Laportea Canadensis*). Common.

*Pine Cone Willow Gall (Cecidomyia strobiloides).*

A mass of closely imbricated leaves at the end of a twig, caused by the arrest of growth at the end of the stem. Regularly cone-shaped. In the centre, surrounded by a thin, transparent covering, is a small orange larva. Occurs on *Salix discolor* and many other species of scrub willows. Common.

*Oak Fold Gall (Cecidomyia niveipila).*

Consists of a dense white pubescence upon the under side of the leaves, causing a distortion and folding of the leaf blade. The pubescence is inside the fold, forming the lining of the gall. Occurs on Red Oak (*Quercus rubra*). Common.

*Wild Cherry Bud Gall (Cecidomyia serotinae).*

A club-shaped, monothalamous gall with one or two leaves growing from its sides. The gall is an enlargement of the terminal buds of young shoots of the Wild Cherry. Occurs on Black Cherry (*Prunus serotina*) and Chokecherry (*Prunus virginiana*). Common.

*Eye Spot Gall of Maple (Cecidomyia ocellata).*

This is a dimple gall surrounded by an areola. At first the gall is entirely green, but at maturity the nipple turns a rich red, the areola surrounding it becomes light yellow in color and a thin line surrounding this turns deep pink in color. The successive rings of color very much resemble a target. In the cavity formed by the underside of the gall rests a small white larva, covered with a viscid secretion. Later in the season the gall turns black and drops out, leaving a circular hole.

This gall has been usually placed as *Sciara ocellata*, but most authorities, including Osten Sacken himself, now place it as *Cecidomyia*, attributing the presence of the *Sciara* to an error in the rearing. Occurs on Red Maple (*Acer rubrum*) and Soft Maple (*Acer dasycarpum*). Common.

*Grape Vine Tube Gall (Cecidomyia viticola).*

A long conical, cylindrical tube-shaped gall, about .7-1 cm. in length by 1.5-2 m.m. in diameter near the base, where it is attached to the leaf by a slight constriction. It tapers to a point at the tip. Monothalamous, containing several minute larvæ. It is green or bright red in color and occurs on the under side of the leaf. Occurs on Wild Grape (*Vitis sp.*). Not common.

*Basswood Wart Gall (Cecidomyia verrucicola).*

Small swellings on leaf of basswood, appearing in May or June. About 3 m.m. in diameter, protruding from both sides of the leaf about 1 1-2 m.m. The upper side has a dimple in the centre. Red above and green below. Open in the fall by means of a circular lid upon the underside. Contains small larvæ. Occurs on Basswood (*Tilia Americana*). Very common.

*Burr Gall on Hawthorn (Cecidomyia bedeguar).*

This is a small cylindrical gall, hollow, red or green in color, about 3 m.m. in height and diameter, and with a hole in the top of it. The top of the gall around the hole is thickly set with spines, making the gall look somewhat like a burr. Inside it are found many small orange-colored larvæ about 1.5 m.m. long. It is monothalamous and occurs on the upper side of the leaf. Occurs on Hawthorn (*Crataegus sp.*). Common.

*Cherry Pocket Gall (Cecidomyia virginiana).*

This gall consists of a malformation of the fruit. The pit or stone is absent and the fruit is enlarged, forming a thick-walled pouch about 1 cm. in length by 5 m.m. in width by 1.5 m.m. in thickness. The gall contains from 10 to 15 larvæ. It has no opening, but later the fruit becomes loosened from the peduncle and leaves an opening. The larvæ leave the gall in June or July. Occurs on *Prunus virginiana*. Very common.

*Ash Midrib Gall (Cecidomyia peller).*

This gall is caused by a swelling and folding of the midrib of the leaflets, the thickening being greatest at the midrib and extending towards the edges of the leaf, often involving nearly the whole of it. The thickened portion is folded together, giving the leaflet the appearance of a bean or pea pod. A small cavity is left at the bottom of the gall which runs the whole length. In this cavity are found minute larvæ, feeding on the green succulent tissue of which the gall is composed. The underside of the leaf is always the outside of the gall. Occurs upon the leaflets of White Ash (*Fraxinus Americana*). Not common.

*Box Elder Midrib Gall (Cecidomyia negundinis).*

Swellings on the midrib of the leaflets of the Box Elder, much resembling *Cecidomyia peller* on the White Ash. The swellings form two long circular chambers, one on either side of the midrib, opening on the upper surface by slits running the whole length of the gall. Occurs on Box Elder (*Acer negundo*). Not common.

*Ball Gall on Hickory (Diplosis caryæ).*

Thin-walled galls, about 3 m.m. in diameter, hard and brittle, attached to the underside of the leaves of *Carya alba* by a projection at the base, which appears upon the upper side as a black dot, surrounded by a light yellow areola. The gall has no opening and contains a very small larva. The hypertrophy is monothalamous. The exterior of the gall is smooth or slightly pubescent. Occurs on *Carya alba*. Common.



*Tulip Tree Midrib Gall (Cecidomyia tulipifera).*

Hollow swellings, varying from .5 to 2.5 cm. in length by 3-4 m.m. in width, on the midrib and lateral veins of the leaves of the tulip tree. Monothalamous. Occurs on Tulip tree (*Liriodendron tulipifera*). Not common.

*Spiræa Pod Gall (Cecidomyia salicifolia).*

The leaves are folded in such a way as to assume the appearance of a pod. The pod is formed by the folding of the leaf along the midvein, and the bulging out of the sac thus formed, the outer margin of which is closely united. The pods vary in size, the largest being about five-eighths of an inch long. Occurs on Spiræa (*Spiræa tomentosa*). Common.

*Willow Club Gall (Cecidomyia rigida).*

This gall is formed on the lateral shoots of the Bush Willow, an enlargement of the whole stem, tapering from the centre to both ends. Occasionally galls are found having terminal shoots growing from them. The gall is about three-quarters of an inch long. Occurs on several species of Bush Willow (*Salix* sp.).

*Goldenrod Bunch Gall (Cecidomyia solidaginis).*

It is found on the main stalk of Goldenrod. An apical gall which prevents the natural elongation of the stem. This unnatural accumulation of several hundred leaves into a globular mass is the result of injury to the terminal bud and consequent arrest of growth in length. Occurs on Goldenrod (*Solidago* sp.). Very common.

*Goldenrod Ball-Gall (Trypeta solidaginis).*

This is a globular ball-like enlargement of the stem of Solidago, about  $2\frac{1}{2}$  cm. in diameter. Pithy in structure, hypertrophy monothalamous, the central cell irregular in shape and containing a large fat larva which develops into a fly with banded wings. It is green in summer and woody in winter. Occurs on Goldenrod (*Solidago* sp.). Very common.

*Vein Gall on Oak (Cecidomyia quercus-majalis).*

These galls are produced along the veins or the under side of the leaves of the Red Oak. They are, narrowly oval, inflated galls much like the *Cecidomyia pudibunda* on Carpinus. The surface of the gall is netted with veins. The wall is quite thin. The opening to the gall is upon the upper side of the leaf, and runs the full length of the gall. The gall is hollow and the interior wall smooth. Green or brown in color. Occurs on Red Oak (*Quercus rubra*). Not common.

*Hickory Nut Gall (Cecidomyia caryæ-nucicola).*

A malformation of the nut produced by a Cecidomyiid, resulting in the formation of large irregular knobs all over the husk of the nut, containing thickwalled cells. Hypertrophy polythalamous. Occurs on Hickory (*Hicoria Alba*). Not common.

*Alder Bud Gall (Cecidomyia serrulata).*

A rounded monothalamous bud gall, a deformation of the terminal bud of the Alder. Occurs on Alder (*Alnus* sp.). Not common.

*Midrib Gall on Virginia Creeper (Cecidomyia sp.)*

This gall is green and succulent. It forms along the midrib of the leaf and occasionally along the side veins. It is flat and generally double, that is, on both sides of the vein. It is on the under side of the leaf and is really an enlargement or thickening in a fold on the leaf near the midrib. It

varies from 1.5 to 4.5 cm. in length, and from .8-1 cm. in width and .4-.6 cm. in thickness. Through the gall runs a single chamber about 1 mm. in diameter. The opening to the gall runs the whole length of the gall and is on the upper side of the leaf. The opening is lined with minute white hairs. In the gall are minute orange larvæ about 1.5 mm. x .6 mm.-2 mm. Occurs on Virginian Creeper (*Ampelopsis quinquefolia*). Common at Guelph.

*Midrib Gall on Touch-me-not.*

An enlargement of the petiole or midrib of the leaf, protruding on both sides of it and averaging about 1 cm. in length x .4 cm. in width. Green, smooth and monothalamous. A single chamber running the length of the gall and containing several minute white larvæ. Occurs on Touch-me-not (*Impatiens fulva*). Common.

*Fruit Gall on Wood Nettles.*

This gall consists of a malformation of the fruit of the woodnettle and sometimes all the fruiting stem is covered with them. The gall is juicy and quite soft in structure and in shape is a long oval with a pointed apex and sessile. The hypertrophy is variable, being sometimes mono and sometimes dithalamous. In the larval chamber, which is about 1 mm. in diameter and surrounded by light colored tissue, are one or two small fat larvæ light brown in color. The larva is segmented and legless. The gall is about .5 cm. in diameter and 1 cm. in length. It is green in color. Occurs on Wood Nettle (*Laportea Canadensis*). Not common.

*Willow Egg Gall (Euura ovum).*

Oval galls on the sides of the twigs of the Bush Willow. The galls are hard and woody and usually the same color as the stem. Occurs on Bush Willow (*Salix sp.*). Common.

*Dogwood Club Gall (Cecidomyia clavula).*

The galls are club-shaped and about 2 cm. in length. Inside is an elongated channel containing a single larva. They are found on the terminal twigs and the color is about the same as the bark. Occurs on Flowering Dogwood (*Cornus florida*). Not common.

*Oak Spangles (Cecidomyia poculum).*

Saucer-shaped galls in clusters on the under surface of the leaf. Usually pale red in color. Occurs on White Oak (*Quercus alba*). Common.

HYMENOPTERA.

*Acraspis macrocarpa.*

This beautiful little gall occurs quite commonly upon the leaves of *Quercus macrocarpa* in this vicinity. It is small, average diameter 3 m.m., and in form globular to oval. Above, it is bright red, fading to yellowish green near the base, where it is joined to the leaf by a small portion of the surface so that it is easily detached without injuring the leaf. The surface of the gall is netted with innumerable fissures, between which are small elevations with very short spines. When on the underside of the leaf the gall is white in color. It is monothalamous and the smooth, hollow chamber contains a single small white larva. The galls occur along the veins.

They much resemble *Cynips pisum*, but are monothalamous and also resemble *Cynips echinus*, but the spines on this gall are scarcely noticeable and *Cynips echinus* and *Cynips pisum* are both polythalamous. Occurs on Burr Oak (*Quercus macrocarpa*). Common.



*The Oak Petiole Gall (Andricus petiolicola).*

This is a midrib or petiole gall. It is hard and woody and projects on one side, generally on the lower. It averages 1.2 cm. by .7 cm. and 8 m.m. wide. It contains several cells lined with hard white tissue which in some cases are arranged like the seed cases in a core of an apple. In each of these is a small white larva, apparently legless, and covered with a viscid transparent secretion. The gall is green or red and more or less roughened on the outside. Occurs on White Oak (*Quercus alba* and *Quercus prinoides*). Common.

*Rose Root Gall (Rhodites radicum).*

A smooth, irregularly rounded, brownish swelling upon the root of the Wild Rose. Reddish brown in color, quite light and pithy in structure and containing numerous cells. From 3 to 5 cm. in diameter. Occurs on roots of Wild Rose (*Rosa* sp.). Not common.

*Spiny Ball Gall on Wild Rose Leaf (Rhodites bicolor).*

This is a very beautiful little gall which is rare in this vicinity. It is monothalamous and is formed upon the leaf of the wild Rose and sometimes all the leaflets are transformed in this way. The gall is a thin-walled ball, red or green in color and covered with short spines. It is monothalamous and contains one small larva about  $\frac{3}{4}$  m.m. long. The gall is about .75 cm. in diameter. The wall is about  $\frac{3}{4}$  m.m. thick. There is no opening. The inside is quite smooth. Occurs on Wild Rose (*Rosa* sp.). Not common.

*Rose Stem Gall (Rhodites globulus).*

This gall is found upon the stem of the Wild Rose. It consists of an abrupt corky enlargement of the stem. It is about 2-2.5 cm. in length and about 1-1.5 cm. in width. It is quite smooth on the outside, not at all pubescent, and green or red in color. A single long chamber runs longitudinally through the gall about 3 m.m. in diameter and irregular in shape. In this are small larvæ about 3 m.m. in length. The larva is dark grey with a lighter head and tail and is legless. Occurs on Wild Rose (*Rosa Carolina*). Not common.

*Mossy Rose Gall (Rhodites rosa).*

It is composed of a mass of hard, small cells clustered around a branch or twig. These cells are covered with a dense thick mass of green filaments which grow from them. The gall is monothalamous and from 1.5-2 cm. in diameter. Occurs on Wild Rose (*Rosa Carolina*). Common.

*The Larger Oak Apple (Amphibolips confluentis).*

Thin walled and globular, about 4 cm. in diameter. Exterior surface smooth (not pubescent) and somewhat irregular. Interior filled with a spongy mass of fibres, very loosely attached to the exterior but tightly attached to an interior woody cell in which the larva lives. Green in the early part of the season, later turning brown and brittle. Generally produced on the upper part of the leaf from the end of one of the veins. Occurs on Red Oak (*Quercus rubra*) and other closely related species. Common.

*Hedgehog Gall on Oak (Acraspis erinacei).*

A round or oval gall growing on the midrib of the leaf. About 1 by 5 c.m. The gall is white or yellowish and covered with fine bright pink or red spines about 1-2 m.m. in length. Attached to the leaf at a point about

the middle of the under side of the gall. Hypertrophy polythalamous. Larval chambers about 1-2 m.m. in diameter. It is found on the upper side of the leaf. Occurs on White Oak (*Quercus alba*). Common.

*Furry Ball Gall on Oak (Neurotus floccosus).*

This is a small spherical gall about 3 m.m. in diameter, which occurs on White Oak on the veins of the leaves upon the under side of the leaf. The gall is thickly covered with fine short hair which forms a cushion all round it. The gall is rather hard, and in the centre of it is a very small thick-walled shell about .25 m.m. in diameter. Occurs on White Oak (*Quercus alba*). Not common.

*Pointed Bullet Gall on Oak (Holcaspis duricaria).*

A spherical ball-like gall produced upon the stem of White Oak and Burr Oak. A short point at the apex of the gall distinguishes this species from *globulus*. Hard and woody, with a small cavity in the centre, containing a small, oval monothalamous, thin-walled, larval chamber. Occurs on Burr Oak (*Quercus macrocarpa*). Common.

*Little Oak Apple (Andricus palustris).*

This gall is produced by a malformation of the leaf blade, nearly always at the outer edge. It is a spherical, monothalamous, hollow ball, projecting from both sides of the leaf. It is from .9-1 cm. in diameter and comparatively thin-walled. The interior cavity is lined with smooth tissue and contains only a small thin-walled ball which rolls about freely in the gall. The single chamber of this ball contains a small larva. This ball is about 2 m.m. in diameter. The insect emerges, through a small hole cut in the side of it, in May. The gall is green or green and red. Occurs upon the leaves of Pin Oak (*Quercus palustris*). Not common.

*Oak Midrib Gall (Andricus piger).*

This gall is an irregular, woody swelling of the midrib of Burr Oak. It averages about 7/8 inches in length, and about 5/8 inches in diameter. Externally it is green, glabrous or slightly pubescent and projecting on both sides of the leaf. Internally it is dense and somewhat woody in structure, and containing numerous small cells about .5 m.m. in diameter, surrounding each of which is a layer of harder tissue. These are the larval cells. The gall-flies escape early in June through holes cut through the gall. Occurs upon leaves of Burr Oak (*Quercus macrocarpa*). Common.

*Furry Ball Gall on Oak (Andricus lana).*

This gall is produced upon the midrib upon the under side of the leaf of the Burr Oak. It is a white, furry, hemispherical mass, varying from 4-11 m.m. in diameter. This is composed of innumerable fine, woody fibres to which are attached small round kernels, in each of which is a minute white larva. These kernels are attached to the midrib of the leaf. Occurs upon leaves of Burr Oak (*Quercus macrocarpa*). Not common.

*Willow Apple Gall (Pontania pomum).*

A smooth, fleshy, sessile, globular or slightly oval monothalamous gall, like a miniature apple. About 1 c.m. in diameter, growing on one side of the midrib of the leaf and extending to its edge or beyond it. The principal part of the gall projects from the underside of the leaf. Color greenish yellow, often with a rosy cheek. Mature about July 31st. Occurs on many species of scrub willows (*Salix* sp.) Common.



*Flat Galls on Willow (Pontania hyalina).*

Fleshy galls, occurring in two parallel rows, one on either side of the midrib, sometimes touching, but not originating from the latter and rarely extending to the edge of the leaf. Sometimes as many as twenty to a leaf. In other cases confined to a row on one side of the leaf, or occasionally occurring singly. Shape irregular, elongate-ovate, projecting equally in both surfaces of the leaf. Color on upper side more or less brownish red, beneath white with slight purplish tinge. "Eggs and larva are subject to attack of mites, thrips, a curculionid (*Anthonomus sycophanta*) and a lepidopterous larva which eats out the entire interior of the gall tenthredinid larva and all." (From Marlatt. "Revision of Nematinae.") Occurs on many species of scrub willow (*Salix* sp.). Very common.

*Pithy Blackberry Gall (Diastrophus nebulosus).*

A large, oblong, polythalamous stem gall, 1 to 3 inches in length, and 1 to 1½ inches in thickness. The surface is uneven with deep longitudinal furrows, which divide the gall more or less completely into four or five portions. Occurs on Blackberry (*Rubus* sp.).

*Lettuce Tumor Gall (Aulax timidus).*

It occurs on the stem of Wild Lettuce. It is an irregular, oval, polythalamous, knotty enlargement of the stem varying greatly in size. The interior is soft and pithy. Occurs on Wild Lettuce (*Lactuca Canadensis*). Not common.

*Oak Button Gall (Neuroterus umbilicatus).*

This gall appears as a small button-like enlargement on the upper and lower surfaces of the leaves of the Oaks. Occurs on Burr Oak (*Quercus macrocarpa*). Not common.

*Oak Bullet Gall (Holcaspis globulus).*

It is found on the twigs of many species of Oak. It is a smooth, round, monothalamous gall. The interior is corky, with a small lighter coloured oval cavity in the centre, containing the larva. It grows singly or in clusters of two or three. Occurs on Burr Oak (*Quercus macrocarpa*), and White Oak (*Quercus alba*). Common.

*Oak Pea Gall (Cynips pisum).*

This is a spherical dithalamous gall, resembling a small pea. The surface is fissured or netted with depressions between which are elevations. It resembles a small pea. Occurs on White Oak (*Quercus alba*) and Burr Oak (*macrocarpa*). Not common.

*Barley Jointworm (Isosoma hordei).*

A small gall forming a woody growth which fills up the cavity of the stalk and causes the joints to swell, and the stalk to topple over. The larva remains in the straw over winter, and the adults emerge in the spring.

*Huckleberry Gall (Solenogopheria vacinii).*

Rounded or elongated galls 1-2 c.m. in diameter on the stem of the huckleberry. They are green or red in summer, and brown, hard and woody in winter. Occurs on Huckleberry (*Gaylussacia resinosa*). Common.

## HEMIPTERA.

By REV. THOMAS W. FYLES, D.C.L., F.L.S., LEVIS, P.Q.

Bugs! "Disgusting!" says the fair reader who may chance upon this article; and truly I agree with her. I have no word bad enough for "the terror that walketh in the darkness"—the old, original "bug-a-boo."

I shall never forget a night I spent on board a small river-steamboat. The vessel left its wharf very early in the morning, and a friend (?) persuaded me to take a berth on board. What a night I spent. No sooner were the lights put out, than I began to experience a creepy sensation that effectually "murdered sleep." (Fig. 18.)

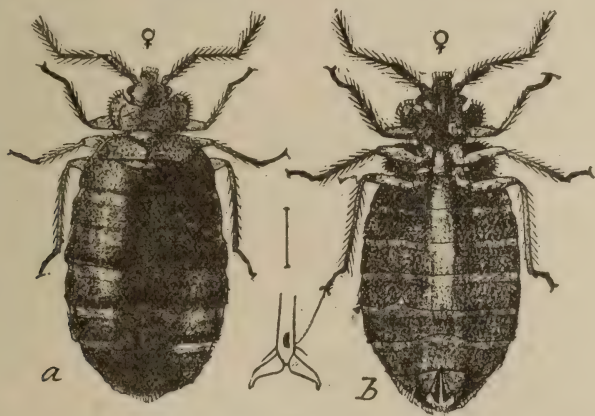


FIG. 18.—Female Bed-bug, much enlarged. a, upper, and b, under surface (after Marlatt.)

Confined in a small crib, and having no light, my case was worse than that of a certain church dignitary and his chaplain who, when on a visitation tour, sought shelter in a cottage, late one night. They were welcomed gladly; and the only spare-bedroom was placed at their service. On retiring the great man turned down the bed-clothes, but quickly turned them back again, for there were things in possession of the bed. He thought discretion the better part of valour, took his valise for a pillow, wrapt his long cloak around him, and stretched himself upon the floor. There he soon slept the sleep of the just. Meanwhile his companion, ensconced in an arm-chair, amused himself by writing a parody on some well-known lines. One verse of his production read thus:—

"No dirty blanket enclosed his breast;  
Nor in sheet, nor in quilt we wound him;  
But he lay like a clergyman taking his rest  
With his camlet cloak around him."

In my entomological investigations in the Province of Quebec, I have met with representatives of the undermentioned families of bugs:—

Corimelænidæ.  
Pentatomidæ.  
Coreidæ.  
Lygæidæ.  
Capsidæ.  
Acanthiidæ.  
Tingitidæ.  
Aradidæ.

Phymatidæ.  
Nabidæ.  
Reduviidæ.  
Hydrobatidæ.  
Belostomatidæ.  
Nepidæ.  
Notonectidæ.  
Corisidæ.



I shall not attempt to give an orderly and systematic account of the various species, belonging to these families, that have come in my way. The space at my disposal in the report will not admit of this. I shall tell, in a desultory way, of some of the more remarkable and interesting of the species, mentioning the family to which each of them belongs.

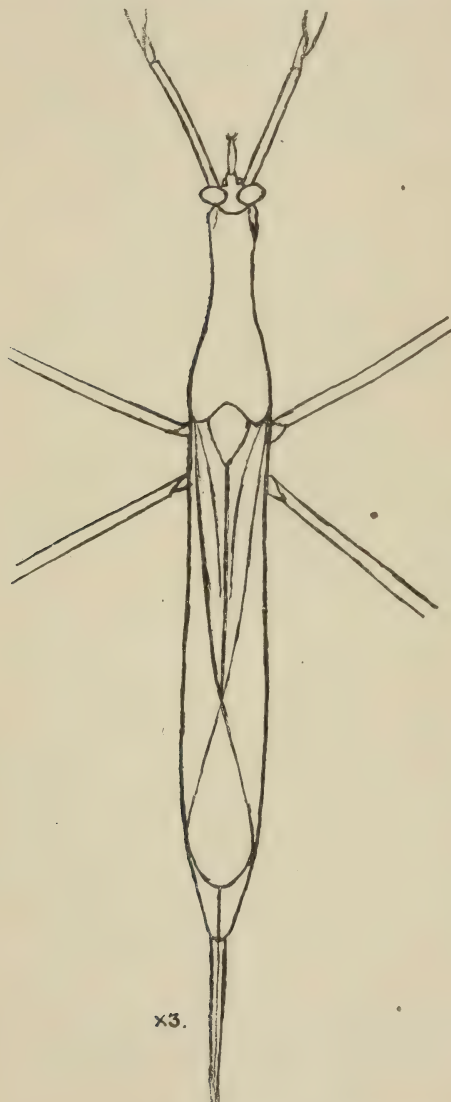


FIG. 20.—*Ranatra quadridentata* (greatly enlarged).



FIG. 19.—Giant Water-bug.

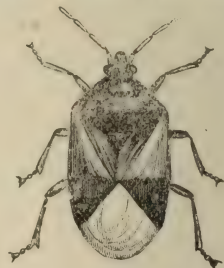


FIG. 21.—A typical Bug.



FIG. 22.—*Corimelaena atra*.

First then, the Giant of the Bugs, far beyond all others of our bugs in size and strength, is *Belostoma Americanum*, Leidy, (Fig. 19), belonging to the *Belostomatidae*. This creature attains a length of nearly two and a half inches, and an expanse of wings of four inches. Its hindmost pair of legs are an inch and three-quarters long, and are used for propelling it through the water. The colour of the insect is dark brown. In the breeding season it occasionally leaves the water; and it is capable of long flights. Its wings are true bug-wings, having the upper part horny, and the lower

part membranous. Its eyes protrude and resemble shining black beads. It has a stout proboscis for piercing its prey, which consists of fishes, tadpoles, etc. Its long stout front legs terminated with sharp claws enable it to grasp its victims firmly.

Another remarkable water-bug is *Notonecta undulata*, Say, belonging to the *Notonectidæ*. This insect is boat-shaped, but the keel is along its back; so it swims with its back downwards—its long legs bending over its sides, and serving as oars. In its movements it reminds one of a boy swimming on his back.

A still more noteworthy insect is *Ranatra quadridentata* (Fig. 20), belonging to the *Nepidæ*. Length is the characteristic of this insect. It has a long slim body, long thin legs, long antennæ, and long terminal respiratory tubes; its front legs are constructed for grasping its prey. It frequents shallow streams, *walking on the bottom*, and lifting the tips of its breathing tubes to the surface for air.

But, if it is wonderful to see a winged insect walking at the bottom of the water, it seems all but miraculous to behold one walking with ease and swiftness on the top. Yet this is the habit of *Hygrotrechus remigis*, Say, and also of *Limnoporus rufoscutellatus*, Fab., both of which are common with us. The former is black; the latter, pale reddish brown. Both belong to the *Hydrobatidæ*.

Of bugs that frequent plants, the Negro Bug (Fig. 22), *Corimelana atra*, Am. et Serv., in the *Corimelanidæ*, is particularly obnoxious. It lays its eggs on small fruits, raspberries, etc. Should a person, by mischance, put a berry that has been visited by the bug into his mouth, a most nauseating taste and smell will quickly cause him to eject it. The bug is a pretty, compact little insect, of a shining black, and almost as broad as it is long. It is often seen on wild strawberry plants; and, when disturbed, it scuttles away to the underside of a leaf.

An insect of economic importance is found in the *Pentatomidæ*. I refer to *Stiretrus fimbriata*, Say. It preys upon the Potato Beetle, *Doryphora decem-lineata*, Say. Unfortunately, it shares the fate of the beetle and is poisoned by Paris Green. *S. fimbriata* is really a handsome insect. Its dark brown wings and deep red thorax outlined with crome-yellow; and it has a peculiar mark, in the middle of the back, of the same colour, and, in shape, resembling an elongated horse-shoe.

Another useful bug is *Podisus placidus*, Uhler (Fig. 23), belonging to the same family as the foregoing. It preys upon the Imported Currant-worm, *Nematus ventricosus*, Klug., and other larvæ. A description of this bug will be found on page 342 of Saunders' "Insects Injurious to Fruits."

In the same genus comes *Podisus cynicus*, Say, a fine bug seven-twelfths of an inch long, and four-twelfths wide. It is of a reddish-brown colour, slightly mottled with black.

A very pretty little bug in this family is *Cosmopepla carnifex*, Fab. It is black, bordered with red, and crossed on the thorax with red. It has also two red spots on the back.

Another fine insect in the same family is *Euschistus fissilis*, Uhl. It is half an inch long and one-third of an inch wide. In colour it is ochreous or pale brown, and it is thickly covered with minute black dots.

A somewhat smaller insect is *Euschistus tristigma*, Say. Its body colour is darker than the preceding; and the flattened edges of the abdomen are marked with alternate black and orange patches. The wings of this species are splendidly iridescent.



A third insect that comes, I think, in the same family is *Homæmus ænifrons*, Say. It is reddish-brown in colour, clouded with darker brown; and it has a peculiar mark, like an elongated cone rising from the end of the abdomen towards the middle of the back. These creatures frequent the heads of grass.

*Acanthosoma cruciata*, Say, is an interesting species in the *Pentatomidæ*. In colour it is ochreous with brown markings, and it has the appearance of having been oiled and varnished. Its back is marked with a floriated cross. When the wings are spread the abdomen on the upper surface is seen to be tinged with vermillion.

But the finest of our species of *Pentatomidæ* is undoubtedly *Pentatoma ligata*, Say. It may readily be known. It is a robust insect, of a rich Brunswick green, bordered with orange red; and it has an orange spot on its back. The insect is somewhat rare at Quebec.

In the family *Coreidæ*, to which the common Squash-bug, *Anasa tristis*, De G., belongs, we have *Alydus eurinus*, Say—a dingy insect, long and narrow with lighter coloured wings.



FIG. 24.—Assassin Bug.

FIG. 23.—*Podisus placidus*.FIG. 25.—*Acholla spinosa*.

In the *Lygæidæ* we have the pretty bug *Lygæus turcicus*, Fabr. This insect is a long oval in shape, black, with a red band across the shoulders, and a red St. Andrew's Cross upon the back. The underside of the abdomen is lurid red.

Among the bugs injurious to plants may be reckoned *Pecilocapsus lineatus*, Fab., (4-vittatus, Say), a pretty yellow bug, with black lines on the wings, and two very conspicuous black spots on the thorax. These insects do injury to the leaves of currant bushes and garden plants; and they also taint the small fruits. They and the next mentioned insect belong to the *Capsidæ*.

*Capsus lineolaris*, Beauv., the Tarnished Plant-bug is ochreous with fuscous shades. It has dark spots along the edge of the abdomen. These insects damage the leaves of pear trees, apple trees, etc.

The *Tingitidæ* are a remarkable family of bugs. The species are very small and very elegant. Seen under a microscope, they appear to be covered with lace-work. On account of this, they have been called "Lace Bugs." The common species is *Corythuca arcuata*, Say. I have found a beautiful species on the Island of Orleans that I have not yet identified. The insects are found on the underside of Alder leaves.

The "Flat Bugs" or *Aradidæ* are found under bark, and in crevices of trees. They are predaceous. In vol. XXXV. of the *Canadian Entomologist*, I have given a full description of a new species that I have taken at Quebec, and have named *Aradus luteolus*.

A bug of remarkable shape is *Coriscus subcoleoptratus*, Kirby, in the family *Nabidae*. It has the head and thorax narrow, and the abdomen greatly widened in proportion to the size of the insect. It is suggestive of a flask. Its body colour is black, but the abdomen has a yellow border. The legs and long sharp proboscis are yellow. Its wings are very diminutive.

In the late summer when our country road sides are adorned with the Golden Rod, the pretty little Fritillary, *Argynnis Myrina*, Cram., may be seen in numbers sporting about the flower heads. Here and there one of these butterflies may be seen motionless—lifeless. If one will take the trouble to look into a case of the kind, he will probably find that the ill-starred insect has fallen into the clutches of a lurking foe, *Phymata erosa*, Fabr., belonging to the *Phymatidae*. This strange insect is yellow beneath, and yellow marked with brown above. It has yellow legs and proboscis, and angulated thorax and abdomen. It lies back downwards among the blossoms of the *Solidago*, patiently awaiting its prey. A butterfly alights with outspread limbs. One of these comes within reach of the expectant bug. Instantly the extended tarsus of the bug springs back over the leg of the butterfly, and into a toothed groove in the disproportionately large tibia of the bug; and the victim is held securely, while its foe thrusts its long proboscis into its body and drains away its life juices.

I will mention only two other species—they are known as "Assassin Bugs," (Fig. 24) for they make other insects their prey. They belong to the *Reduviidae*, to which the "Kissing Bug" of ill-repute, *Melanolestes picipes*, H.S., also belongs.

*Acholla multispinosa*, De G. (Fig. 25), is a brown insect, two-thirds of an inch long. It has a forbidding appearance, which is well, for it is a dangerous creature. On pages 73-5 of the Thirtieth Annual Report of the Entomological Society of Ontario, Dr. Bethune has given a well-authenticated account of the death of a child from a puncture from the proboscis of a bug of this species. The child was wounded under the knee, and blood poisoning ensued.

The other species is *Opsicætus personatus*, Linn. It is a larger insect than the last mentioned, being three-fourths of an inch long; and—with the exception of the under wings—it is wholly black, or very dark brown. When its wings are outspread, its abdomen is found to be hollowed out, like a scoop or spoon. This species enters houses in search of *Acanthia lectularia*, Linn. Its larva has the habit of covering itself with a coat of dust or mud, and, so disguised, escapes notice till its motions betray its presence.

I do not think the *Reduviidae* go out of their way to inflict injury upon human beings. I think it may be said of them that, *unmolested*, they do not molest.

The late highly esteemed J. Alston Moffat once told that he had held a specimen of *A. multispinosa* firmly between his finger and thumb, while he searched for a pin wherewith to transfix it. The bug managed to get its head free, and then, *sent in its little bill for damages*, greatly to Mr. Moffat's discomposure.

Disagreeable as many species of the Hemiptera undoubtedly are, they yet serve valuable purposes in keeping down the numbers of other and injurious insects; and the habits of some of them are so remarkable as to claim more than a passing notice. In dealing with them the poet Cowper's rule is worthy of attention—*of course entomologists are exempt from it!* He says:—



"The creeping vermin, loathsome to the sight,  
 And charged perhaps with venom, that intrudes,  
 A visitor unwelcome, into scenes  
 Sacred to neatness and repose, th' alcove,  
 The chamber, or refectory, may die:  
 A necessary act incurs no blame.  
 Not so when, held within their proper bounds,  
 And guileless of offence, they range the air,  
 Or take their pastime in the spacious field;  
 There they are privileged: and he who hunts,  
 Or harms them there, is guilty of a wrong,  
 Disturbs th' economy of Nature's realm,  
 Who, when she formed, designed them an abode,  
 The sum is this. If man's convenience, health,  
 Or safety, interfere, his rights and claims  
 Are paramount, and must extinguish theirs  
 Else they are all—the meanest things that are—  
 As free to live, and to enjoy that life,  
 As God was free to form them at the first,  
 Who in His sov'reign wisdom made them all."

*The Task*—Line 568 to line 587.

## BASSWOOD, OR LINDEN, INSECTS.

BY ARTHUR GIBSON, EXPERIMENTAL FARM, OTTAWA.

The following notes on insects found feeding on basswood, *Tilia Americana*, are chiefly from records handed to the writer since the publication of a paper on the above subject which appeared in the 34th Annual Report of this Society, and of a further paper in the 35th Annual Report. In the first paper 94 species are listed, and in the 1904 Report further notes on some of these insects are given, as well as notes on 8 other species, which brought the list up to 102.

### ATTACKING THE FOLIAGE.

#### ORDER HOMOPTERA.

Mr. W. Metcalfe, of Ottawa, who has devoted considerable time to the collection and study of homoptera and hemiptera, has been good enough to give me 15 records, which I am glad to include here. All of the species found by him were on basswood.

103. The common "Buffalo-tree hopper," *Ceresa bubalus*, Fabr. Five specimens of a dark form taken, Ottawa, July 14, (Metcalfe).

104. *Telamona reclinata*, Fitch, Ottawa, July 1, (Metcalfe). Mr. Metcalfe tells me that he has taken later in July five specimens, all on basswood, of a species of *Telamona*, which does not seem to be *reclinata*.

105. *Ormenis pruinosa*, Say. Mr. Otto H. Swezey, in his "Preliminary Catalogue of the Described Species of the Family Fulgoridæ, of North America, North of Mexico" (Ohio Dept. Agric., Div. Nursery and Orchard Inspection, Bull. 3) mentions basswood among a great many other food plants of this homopterous insect. The insect is rare in Ontario.

106. *Lamenia vulgaris*, Fitch. Ottawa, July 1, (Metcalfe).

107. *Bythoscopus variabilis*, Fitch, var. Ottawa, June 19 to 24, (Metcalfe). This insect is a near relative to the very injurious grape vine leaf-hopper which is so abundant some seasons in Ontario.

108. *Agallia novella*, Say. Ottawa, June 24, (Metcalfe).

109. *Diedrocephala coccinea*, Forst. Ottawa, bred from basswood, maple and hickory, (Metcalf).

110. *Deltoccephalus Sayi*, Fitch. Hull, Que., July 1, (Metcalf).

111. *Empoasca flavescens*, var. *Birdii*. Ottawa, Aug. 14, (Metcalf).

112. *Empoasca mali*, LeB. Hull, Que., June 24; Britannia-on-the-Bay, Ont., Aug. 7, (Metcalf). This insect, which is known as the apple-leaf hopper, is, according to Smith, "seriously troublesome in some years" in New Jersey, but it is not a pest of any importance in Canada.

113. *Typhlocyba rosæ*, L., the common rose-leaf hopper. Ottawa, July 1, (Metcalf).

114. *Typhlocyba querci*, Fitch, var. *bifasciata*, G. and B. Hull, Que., June 24; Britannia-on-the-Bay, Ont., Aug. 7, only found on basswood, (Metcalf).

#### ORDER HEMIPTERA.

115. *Lygus invitis*, Say. Hull, Que.; Ottawa; August, 60 specimens, (Metcalf). This insect belongs to the same genus as the common well known pest of garden plants, the Tarnished Plant bug, which is very abundant in many parts of Canada.

116. *Gargaphia tiliæ*. Walsh, Ottawa, taken only on basswood, August, (Metcalf). In Smith's List of New Jersey Insects, it is stated that this insect "ranges from New York to Virginia."

117. *Tingis arcuata*, Say. Hull, Que., July 1, (Metcalf). In Packard's Forest Insects the species is mentioned as having been found on the under sides of the leaves of the White Oak.

118. *Coriscus inscriptus*, Kirby. Ottawa, June 19, (Metcalf). Smith states that this insect "occurs from Canada to Virginia and California."

#### ORDER LEPIDOPTERA.

19 of 1903 List. *Ennomos alniaria*, L. Although the larva of this common moth has been recorded on several occasions by other writers as feeding on basswood, it was not until the past season that the caterpillar was found on that plant in the Ottawa district. At Meach Lake, Mr. C. H. Young collected a larva which pupated on Sept. 10.

119. *Smerinthus jamaicensis*, Drury. In the preparation of my first list of basswood insects, I omitted to include this species, the larva of which feeds on a variety of plants, such as elm, apple, plum, willow, poplar, ash, birch, basswood, etc. In Lugger's Fourth Annual Minnesota Report, plate XV., there is a good figure of the mature larva. In Canada, the species is widespread, occurring as far west as Medicine Hat, Assa., from which place, in 1900, eggs were sent to the Division of Entomology, by Mr. T. N. Willing. The eggs hatched on June 5, and notes were taken on the larval stages. The larvae were fed on willow and poplar.

120. *Mineola indigenella*, Zell. var. *nebulella*, Riley? In 1904 we reared from apple some specimens of a small moth which seems indistinguishable from this apple feeding species. The habits and appearance of our larvae, however, are different from those of *indigenella* as published by Riley and Saunders, and Dr. Fletcher thinks that it cannot be the same. On Sept. 20, 1905, the writer found on basswood three of the larvae, all on the upper side of the leaf. In each case the larva was resting under a slender tent of silk, which was about half an inch in width and nearly an inch in length. The three leaves were all put in the same breeding jar, but two days after collection I was surprised to see only one larva in the jar. On looking closely, however, I found portions of each of the other two, and there was no doubt



that a serious tragedy had taken place. The remaining specimen spun a cocoon in a fold of a leaf on Sept. 23. When mature the caterpillar is five-eighths of an inch long, body pale green, the black noticeably washed with yellow. Head rounded, green, marked with numerous small reddish-brown dots and large blotch-like spots, the small dots being particularly on upper portion of head. On each side of the body there is a dark brown stripe, broken in places, and touching these two stripes crossing the back is a series of conspicuous wide bands of the same colour. These and the side stripes have a very ladder-like appearance. The spiracles are black and very small, as are also the tubercles. From each of the latter there is a single pale hair. The feet are concolorous with the ventral surface of the body.

61 of 1903 List. *Apatela morula*, Grt. On several occasions recently the larva of this noctuid has been beaten from the foliage of basswood at Ottawa. The writer found the caterpillar on July 30 last, and Mr. C. H. Young collected mature specimens on Sept. 2 and 5. Other food plants are elm and apple. When full grown the larva is about two inches in length and is of a light olive grey colour. The head is black, and down the centre of the dorsum there is a wide, uneven, dark gray band, yellowish centrally. On body segments 4, 7 and 11 there is a conspicuous dorsal enlargement, which is bordered on the sides with black. Along the sides of the body are a series of V-shaped blackish marks, with the round black spiracle at the base. The hairs from the tubercles on the body are thin, whitish and rather inconspicuous. In March, 1901, Mr. Young found the cocoon of this moth under the bark of an elm tree, about four feet from the ground, and since that date in confinement, he tells me that two larvae entered soft dead wood to the depth of fully an inch and there pupated.

#### OCCURRING ON THE BARK.

##### ORDER HOMOPTERA.

121. *Eulecanium cerasifex*, Fitch. On July 18, I collected some scales on basswood and elm. These were on the lower branches of some old trees growing near the Arboretum of the Central Experimental Farm. Through the courtesy of Dr. Howard, they were identified as the above species by Mr. Sanders. The scales were fairly abundant on both kinds of trees. In Mrs. Fernald's Catalogue of the Coccidæ of the World, the following food plants are given:—cherry, plum, peach, apple, pear, maple, oak, ash.

#### BORING INTO THE WOOD.

##### ORDER COLEOPTERA.

122. The Cherry Flat-headed Borer, *Dicerca divaricatu*, Say. Specimens of this insect were found in basswood on July 9 last by Mr. Frank Morris, of Port Hope, Ont., on the shore of Rideau Lake, near the Narrows Locks, Ontario. This insect, which is well known as being destructive to cherry and peach trees, is common in Ontario, and always injuriously abundant on maple and beech, as also sometimes on pine, birch, hickory and other trees. The mature insect is a brownish, or blackish bronzy beetle, of rather stout build, from three-quarters to almost an inch long.

84 of 1903 List. *Parandra brunnea*, Fabr. From the same wood as the specimens of *Dicerca divaricata*, Say, were taken. Mr. Morris also collected 30 specimens of *P. brunnea*, Fabr. This insect, while it is sometimes found in numbers as occurred at Rideau Lake in July last, is an uncommon species. It is widespread in distribution. The grubs live in the wood of stumps and old trunks of various deciduous and coniferous trees, the beetles being found under the loose bark.

## INSECTS INJURIOUS TO ONTARIO CROPS IN 1906.

By DR. JAMES FLETCHER, DOMINION ENTOMOLOGIST, OTTAWA.

The weather conditions in Ontario during 1906 were very variable. In eastern Ontario the summer was exceptionally dry with two or three periods of excessive heat. The precipitation, however, for the whole province notwithstanding the shortage in the east was slightly above the average, and in western Ontario for the month of October was abnormally large. Crops were on the whole good in nearly all districts, both in quality and quantity.

GRAIN CROPS were little injured by insects. Spring wheat was particularly free from insect attacks of all kinds and little was heard of rust. Fall wheat was decidedly above the average, and the Hessian Fly seems almost to have disappeared. Not a single report of Joint-worm in Ontario crops was received. Barley was one of the best crops which has been harvested for many years. Oats in the western counties were heavy, and there was some difficulty in harvesting, owing to the crop being lodged by rain storms. In the eastern counties, the quality was high for the most part, although a few crops were light for lack of timely rains. Grasshoppers in a few localities reduced the yield by cutting off the grains just before ripening. Peas were a good crop and the Pea Weevil was hardly mentioned. The area being sown to this important crop is again gradually increasing. The corn crop throughout the province was exceptionally good, both for the silo and for grain.

Roots in the western counties were good, but in the east were rather small and dry for lack of fall rains. There was very little injury this year to turnips by the Turnip Aphis, the only reports of serious injury coming from the counties of Victoria, Durham and Northumberland. Potatoes in the east were small but of high quality. There was little complaint of loss from Potato Rot, largely due to the fact that farmers are spraying much more systematically than hitherto to control this destructive disease. The standard remedy, Poisoned Bordeaux mixture, made with six pounds of copper sulphate, four pounds of unslaked lime, and eight ounces of Paris green in 40 gallons of water, has given very satisfactory results wherever tried. The experiments carried on at Ottawa regularly every year by the Horticulturist of the Central Experimental Farm have proved conclusively that three sprayings of the fields, the first one being applied in the middle of July, and the subsequent ones two weeks apart afterwards, give very paying returns. A fourth spraying gives better results, but it seems difficult to get farmers to make this extra application. Cutworms, although little complained of, were abundant and destructive in some places. Wherever tried, the poisoned bran remedy surprised those who used it with its effectiveness. Even in an exceptional and widespread outbreak in the grain and sugar beet fields of the West, this same remedy proved so remarkably successful, that many letters were written to newspapers and agricultural journals, giving the results of trials by those who had benefited from it.

FODDER CROPS. Clover was attacked to some extent by the Clover-seed Midge, but on the whole, the crop of seed was above the average for quality. In the eastern counties, clover fields were remarkably thinned, owing to the mild winter with little snow, which was very severe on all meadows. The Black Army-worm, *Noctua fennica*, and the Clover Cutworm, both levied heavy toll on the very much reduced stand of clover. Rape, which is now being much more grown than formerly, was severely injured in several places by the caterpillars of the Small White Cabbage Butterfly, which appeared in vast numbers during the months of September and October.



An interesting observation was made on the Experimental Farm, where a field of late turnips was practically cleared of swarms of these caterpillars by the English Sparrow. The observation was made by Mr. B. Nothnagel, who watched them for several days, and by driving the birds away suddenly, induced them to drop their prey so that he might examine it. It is pleasing to have a good word to say for these very troublesome and destructive birds.

**VEGETABLES.** Carrots in gardens were attacked in a few places in the Ottawa district by the Carrot Maggot, or Carrot Rust Fly. This injury was not widespread nor quite so severe as in 1905. The remedies which gave the best results, were spraying the rows of plants immediately after they were thinned out, with a carbolic acid and soap wash, or with kerosene emulsion. Dusting the plants with hellebore was also apparently effective, but even in untreated beds, the insect disappeared about the beginning of July, and late sown carrots were entirely free of attack. The Onion and Cabbage maggots were conspicuously less destructive in many parts of the province than has been the case for some years. This report, however, was not applicable in all parts, as was evidenced by the large numbers of enquiries for a practical remedy. Such, however, it must still be acknowledged has not so far been discovered. Good results on small areas were secured by dusting the plants from the beginning of the season once a week with a light dressing of powdered white hellebore, either pure or mixed with three times its weight of land plaster. A remedy which has often been recommended in newspapers is to brush away the soil from the bulbs as soon as these begin to form. In experimenting with this remedy, it was found rather difficult to apply in certain soils, but on the whole gave good results, particularly where the treatment was supplemented by dusting with the hellebore powder.

The Asparagus Beetle was a rather serious pest to the growers of this highly esteemed vegetable, and extended its eastern range in the province considerably during the past season. It was a troublesome pest as far east as Toronto, and specimens of the larvae were found by the writer during September on a small bed of asparagus on the Experimental Farm at Ottawa. The mature beetles were reared later, and the species proved to be *Crioceris asparagi*. The remedies which have given the best results are dusting the plants when the larvæ occur, with a mixture of freshly slaked lime and Paris green. This is more effective if it can be done when there is dew on the plants, or when they are wet either from rain or after being sprayed. Both the beetles and the larvæ may be beaten from the plants into nets or into open pans containing water with a little coal oil on the top. Poultry of all kinds when available are useful in eating the beetles when they first appear in spring.

Potatoes in gardens were seriously attacked and very much reduced in yield by the Potato Leaf Aphis, *Nectarophora solanifolii*, Ashm. This was in the east of the province, and the injury was much aggravated by the exceptional drought. The Colorado Potato Beetle was noticeably less injurious than usual in the early part of the season, but it made up for any early absence by the excessive abundance in autumn.

**FRUIT CROPS.** The apple crop of the province for 1906 may be described as rather short in quantity, but of excellent quality in the eastern counties. In western Ontario, the ravages of the Codling Moth were severe, and throughout the province more injury was done by the Plum Curculio to apples than in any previous year of which we have statistics. This, to some measure, may have been due to the poor plum crop, which was a character of the season, and which is accounted for in various ways by differ-

ent writers. Probably the factor of most importance was cold, windy weather at the time of blooming. Sweet cherries were much reduced by winter killing of the buds, and by the falling of the fruit after setting. Sour cherries gave an excellent crop free from insect injury. Small fruits were abundant with the exception of strawberries, which were very much winter killed in the eastern end of the province.

The Codling Moth was more complained of than for many years, and where spraying was not resorted to the loss was great. In western Ontario, apple growers are now recognizing that they must both spray and band their trees to prevent loss, and moreover that this work must be persisted in and carefully done year after year. Banding the trees alone is useless, unless the cocoons of the caterpillars which have resorted to them for spinning up are removed or crushed at short intervals. The bands should be put on from the middle of July, and examined at least once a week until no fresh cocoons can be found. The irregularity of development in the Codling Moth makes it sometimes difficult for fruit growers to understand the true nature of this insect. In the eastern part of the province there is normally only one brood of this insect, whereas, in the west, there are two. There are, however, always a few individuals of each brood which behave in an exceptional manner. Of a large number of caterpillars of the Codling Moth collected at Ottawa in July, 1905, a few emerged the same summer, and would in a state of nature have given a second brood of larvae. By far the larger proportion of the brood, however, behaved in the normal way, and went over the winter as larvæ. Just at the time of spinning up, there were three or four days of excessively hot weather, which may have been the cause of some of the caterpillars producing moths the first summer. Several of the moths emerged at the proper time the next spring; but a small proportion of the larvæ are actually still unchanged in their cocoons at the present time, (December 1906), and as they are healthy they will probably emerge next year, thus showing that of the same brood some emerged as moths within a few weeks of the time of spinning up, while others treated in exactly the same way could remain in the cocoon for very nearly two years. In coming to a decision as to the number of normal broods of an insect, a matter of great importance in devising remedies, it is therefore necessary to take a general view of the facts, and not come to conclusions from exceptional variations in habit.

The Plum Curculio was exceedingly destructive to apples in many parts of Ontario and Quebec provinces during the past summer. Some apples sent from a locality near Toronto contained three or four grubs to each apple. The apples were seen to be falling to an unusual extent towards the end of June, and were sent for examination as to the cause of this dropping. The grubs of the Plum Curculio leave the apples during the month of July, and change to pupæ in the ground, the beetles emerging a few weeks later in August and September, and passing the winter as beetles. Good results, as far as the insect is concerned, have been secured by ploughing up sod in infested orchards at the end of July or early in August. If there were any anxiety as to stimulating too late a growth of the trees by the practice, it might be offset to a large measure by sowing the land at once to a cover crop to absorb soil moisture, the object of the ploughing being to break up the cells in which the delicate and soft pupæ are contained, so that many of them might be crushed or injured by the operation or might be exposed to their bird and insect enemies. The remedy in Canada which has given the best results against the Plum Curculio, and which is decidedly the most economical of those usually recommended, is the



spraying of the trees with the Poisoned Bordeaux mixture in the same way that apple trees are sprayed for the Codling Moth and fungous diseases.

The San Jose Scale. There has recently been a renewal of interest in the subject of the San Jose Scale, which has been a little more noticed than for a year or two in districts lying beyond the main centres of infestation. As a matter of fact there is very little news to be given concerning the occurrence of this most injurious insect in Canada. It is satisfactory, however, that more attention should be paid to it by fruit growers. The standard lime and sulphur wash is quite effective, and if used, as has been advised, year after year, will keep trees clean enough to bear good crops, and if persisted in as a regular annual treatment, not only this insect but many others as well as fungus diseases of various sorts will be gradually exterminated or prevented from injuring the crop to a marked extent.

The Apple Maggot, *Rhagoletis pomonella*, Walsh. In 1896 the Apple Maggot, also known as the Railroad Worm from the brown marks made through the flesh of the infested apples by the maggots, was first noticed as an injurious insect in Canada. This was in Lennox County. Since that time very little injury has been noticed in the orchards where it was first observed, but during the past summer there are reports of rather widespread infestation throughout the adjoining County of Prince Edward. The injury is serious, as it renders the fruit unfit for the market without showing any very apparent marks on the outside. The injury is caused by slender white maggots about  $\frac{1}{4}$  of an inch in length, which burrow in all directions through the flesh of the apple, feeding upon the pulp and leaving discoloured galleries. The white maggots are extremely difficult to see, but there may be several within a single fruit. The eggs are inserted beneath the skin of the apple by the females which are strikingly beautiful little black and white flies with banded bodies and golden eyes. These are about half the size of the ordinary housefly, and although they do not fly far are very active in their movements. There is only one brood in the year, but the flies emerge very irregularly and may appear at any time from midsummer until autumn. The young maggots become full grown in about six weeks, when they leave the apples and enter the soil for a short distance, where they turn to yellowish white smooth puparia. Apples which are infested for the most part fall to the ground, and the maggots remain in the fallen apples for a short time after they have fallen. Maggots from late laid eggs are often inside the fruit when it is picked. Consequently apples, which are apparently quite good at the time of picking, may in a short time become perfectly useless. All varieties of apples are liable to attack, but some much more so than others. As a general statement, early and sweet apples are most infested. It is possible that this serious enemy of the fruit grower may before long be one of the enemies which will require to be reckoned with every season. For many years it has been the cause of much loss in Vermont, Maine, and in parts of New York State. There have also recently been some rather serious outbreaks in Canada, in the provinces of Quebec and New Brunswick. It is satisfactory to know that the injury, even in the worst infested localities, fluctuates very considerably in intensity. The only practical remedy so far known is to destroy all infested fruit as soon as that fact is discernible. Windfalls should be gathered up carefully, and at short intervals during the summer, and should at once be fed to stock or destroyed in some other way. What is thought to be the most economical and effective way of doing this is to allow growing pigs to run in the orchard from July, when early apples which are particularly liable to attack begin to fall, and the animals should be kept in the orchard until all fruit is gathered. Sheep will eat apples if there is not too much grass on the

ground, but they are less useful for this purpose than pigs. Chickens and other poultry are likewise of service. The ground under apple trees in districts where the Apple Maggot is known to occur should be cultivated regularly. If no stock is available to which fallen fruit can be fed, it should be buried in a deep hole, and then covered up with two or three feet of earth. As the egg of the apple maggot is inserted into the flesh of the apple by the females with their sharp ovipositors, there is no spraying mixture which can be used against this insect.

**FLOWERS.** In flower gardens, one of the striking outbreaks of the year has been the abundance in many parts of Canada of the minute Moth-flies, or White Flies. Such specimens of these as have been examined seem to be the Greenhouse White Fly, *Aleyrodes vaporariorum*, and it is possible that they may have been introduced into gardens with fuchsias and other plants propagated in greenhouses, and owing to some climatic condition have this year increased out of doors to a much larger extent than is usual. Although extremely small, these minute fly-like sucking insects are very destructive. The larval and nymph forms bear a somewhat close resemblance to their near relatives the scale insects. Plants which were badly infested at Ottawa were cucumbers, tropæolums, fuchsias and lilac bushes, but many other kinds were also more or less attacked. White Flies are difficult to control, but may be kept in check by the constant spraying of infested plants with whale oil soap solution, or a diluted kerosene emulsion. In greenhouses probably fumigating with hydrocyanic acid gas is the best remedy. ,

**SHADE TREES.** Ornamental shrubs and shade trees were severely attacked early in the season over a large part of the province by enormous numbers of plant lice, of many species. Trees particularly infested were soft maples by a species of Woolly Aphis, which was found in large clusters beneath the leaves of the Silver Maple, *Acer dasycarpum*, and its numerous varieties. Another new attack of the Silver Maple of more than usual interest was the wholesale destruction of the seeds by the larvæ of the Nitidulid beetle *Epuræa rufa*. The seed was produced in large quantities this year, and was ripe by the middle of June. Towards the end of the month some sacks of the seed were collected for sowing. They had lain on the ground for a few days; but were apparently in good condition. During July, however, it was found that nearly every seed was infested by slender, dirty-white grubs about  $\frac{1}{4}$  inch long, with a testaceous roughened dorsal patch across the middle of each segment. Every seed contained from 12 to 18 of these grubs, which had reduced the contents of the seed to a green meal-like powder. When fully-fed, the grubs left the seeds and pupated near the surface of the ground. In August, large numbers of the beetles emerged. In the soil were also found many of the small cocoons of a parasite which has not yet emerged. The beetles of the family to which *Epuræa rufa* belongs are for the most part scavengers in habit, living upon dead and decaying animal and vegetable substances, but in this instance sound seeds were attacked, and the species can evidently be a destructive enemy to one of our favourite shade trees.

Birches of all kinds were covered from top to bottom with myriads of plant lice, so that by the middle of July the leaves began to fall noticeably. Early in July the abundance of Lady-bird beetles was noticed, particularly of the common Two-spotted Lady-bird *Adalia bipunctata*, and by the end of the month these had increased so much that the infested birch trees were almost cleared and the leaves took on a strange dirty appearance from the enormous numbers of the pupæ of the *Adalia*, as many as 18 to 20 being found in many instances on a single leaf. The good work done by



these insects in clearing the trees of their enemies was, however, only rewarded by these themselves proving a prey to another of nature's factors in preserving the balance of life. A very small percentage of these pupæ gave forth the beetles; instead, most of the pupæ produced a swarm of minute hymenopterous parasites.

Elm trees were badly attacked by the Woolly Elm-leaf Aphis, which, during the month of June, curled up the leaves of the elms used as shade trees, and made sidewalks and seats, or even walking beneath the trees, most unpleasant, owing to the showers of honey-dew which constantly fell from the clusters of plant lice. The Elm Soft-scale, *Lecanium canadense*, was also abundant and destructive in many places. The White Cedar or American Arbor-vitæ was seriously disfigured by the attacks of two minute moths, *Argyresthia thuella*, Packard, and in far less numbers *Recurvaria thujaella*, Kearf. The injuries to these trees were so severe throughout the Ottawa district, both on private grounds and in the woods, as to give a rusty sickly appearance to all of the white cedars by reason of the large number of tips of young twigs which had been killed by the caterpillars boring inside them in autumn and again in the following spring after reviving. The minute caterpillars lived singly in a small twig, and each one was able to destroy a surprisingly large amount of green growth. The beautiful little moths, silvery white with brown markings, were found flying in clouds around the trees during the latter half of June.

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### ENTOMOLOGICAL RECORD, 1906.

BY DR. JAMES FLETCHER, DOMINION ENTOMOLOGIST, AND ARTHUR GIBSON,  
OTTAWA.

Judging from reports which have come to hand in connection with the Entomological Record, there has apparently been rather less enthusiasm than heretofore among collectors of insects in Canada during the past season. The personality and energy of Mr. R. V. Harvey, of Vancouver, have been effective in stirring up an unusual interest in all orders of insects in our Pacific province; and, as Secretary of the British Columbia Entomological Society, he has issued three most interesting quarterly bulletins, in which are valuable records of captures and items of entomological news, which will be useful for reference by all who take up the study of British Columbian insects. We trust that these bulletins will be continued regularly, and that all the members of the Society will see the advantage of promptly and regularly communicating to the secretary items bearing upon the provincial insect fauna.

Reports as to the nature of the season in 1906 were of a very diverse nature and were evidently much affected by local conditions. As an instance of this, the writers found sugaring for moths remarkably unremunerative at the Experimental Farm, Ottawa, while two other collectors, Mr. J. W. Baldwin, at Britannia Bay, about six miles west, and Mr. C. H. Young, at Meach Lake, fifteen miles north, noted the abundance of night flying moths at sugar. The suggested local cause affecting the question at the Experimental Farm, was that there was a remarkable outbreak of aphides on almost all kinds of trees and shrubs in the early part of the season, by which all foliage was thickly coated with honey dew, which proved more attractive to the moths than the treacle put on the trees. However, as is always the case, steady collecting was rewarded with many treasures.

Mr. J. D. Evans, at Trenton, was remarkably successful in collecting microlepidoptera in a lantern trap made as described by Mr. W. D. Kearfott.

A large number of notes of captures have been received from various parts of the Dominion, but some of the writers do not quite seem to understand what the scope of this record is, from the point of view of the present compilers. Large and complete lists of insects taken in a given locality are not desired; but merely notes on such as are of rare occurrence there, or concerning which specialists may have given interesting information in their letters. The capture of an insect beyond its recorded range or at an unusual season are records of value.

We beg gratefully to acknowledge the greater care which has been shown by several correspondents in giving exact data when these were procurable, and we would now point out that it would help materially in the preparation of Notes of Captures if correspondents, when sending in records, would put opposite each record, the number of the insect in the recognized check list of the order. This has been done by a few and is of very great assistance in making up the Record.

As in the past, we have again to express the great obligation Canadian collectors are under to the leading specialists in many orders of insects. Particular mention must be made of Dr. L. O. Howard, Dr. H. G. Dyar, and Mr. D. W. Coquillett, of Washington; Dr. J. B. Smith, of New Brunswick, N.J.; Dr. H. Skinner, of Philadelphia; Mr. W. D. Kearfott, of Montclair, N.J.; Prof. Wickham, of Iowa City; Prof. Hine, of Columbus, O., and Mr. E. P. Van Duzee, of Buffalo. All of these gentlemen have contributed largely to the exact identification of our Canadian captures during the past year. We again point out the wisdom of the greatest liberality in providing these specialists with any specimens they may desire from Canada. It is only after many years of study and collecting that they have reached the positions they now hold, of being able in a short time to name the specimens submitted to them. If at any time it is indicated that specimens would be acceptable, every effort should be put forth to discharge, in part at least and as soon as possible, the heavy debt of gratitude under which so many of us lie for past favours in the identification of material which, but for the assistance so freely given, would be comparatively useless.

During 1906 there have been a few expeditions made in Canada for the purpose of collecting insects; meagre records only of these have been received, either as to the special objects for which they were made, or as to the material collected. The officers of the Geological Survey of Canada, who in the past have collected many scarce insects from the little known regions visited by them in connection with their official work, during the past year, for one reason or another did not bring back many insects. The only collection made was a small one by Mr. L. M. Lambe in British Columbia. This is to be regretted, although the difficulties of collecting and preserving such fragile specimens as insects are well understood, and of course such collections are beyond the limits of the regular work for which most of the officers of the Geological and Natural History Survey Department go to the field. Mr. Theodore Bryant made a valuable collection of lepidoptera when engaged with the International Boundary Survey of the Alaska Coast strip. His work took him along the Taku River and the Tallsaykway, a tributary of the Taku. Messrs. George White Fraser and Robert Smith of the same survey also made a small but interesting collection chiefly Coleoptera and Hymenoptera in the Skagway District of Northern British Columbia. Messrs. R. V. Harvey and R. S. Sherman, of Vancouver, made an interesting collecting trip over the Hope Mountains from Fort Hope on the Fraser River, to Princeton on the Similkameen, a distance of 65



miles, between July 10 and 28. Many interesting lepidoptera and diptera as well as insects in other orders were collected. An account of this expedition is given in the Quarterly Bulletin of the British Columbia Entomological Society for September, 1906. Dr. Harrison G. Dyar again visited British Columbia this year, but his chief work was done with relation to mosquitoes and their habits. Mr. E. B. Williamson, of Bluffton, Ind., collected in Northern Ontario between July 29 and August 6 and secured a large amount of material. The syrphid flies (14 species) are now in the hands of Prof. R. C. Osburn, of Columbia University; and the Odonata are being worked up by Mr. Williamson and Dr. E. M. Walker. Mr. C. H. Young, of Ottawa, spent the summer at Meach Lake, Que., in the Laurentian Mountains, where he collected assiduously and reared many specimens from larvæ. He was particularly successful in collecting microlepidoptera, and set up in his characteristically exquisite manner over 1,500 specimens, all of which may be described as perfect. Mr. G. A. Moore, of Montreal, made a large collection of hemiptera at Como, Que., a complete list of which will appear at an early date in the *Canadian Entomologist*. In the present record, notes will be found of a few other insects taken by Mr. Moore at the same time. The Montreal collectors have had regular meetings and excursions, and, in addition to the work of the Montreal Branch of the Entomological Society of Ontario, the recently organized Mount Royal Entomological Club has done good work and has published a small pamphlet, Nos. 1 and 2, of proceedings. The Ottawa entomologists have continued to work energetically in connection with the Ottawa Field-Naturalists' Club, making many expeditions. A record of their work will be found in the *Ottawa Naturalist*, which is published regularly by that club. Messrs. T. D. Jarvis and E. J. Zavitz, working with the Rev. Prof. Bethune at the Ontario Agricultural College, have created much interest in entomology among the students. Mr. Jarvis has specialized on galls and gall insects and has accumulated a large collection. Mr. Zavitz has directed his attention chiefly to forest insects, and both will be pleased to hear from correspondents in all parts of Canada concerning these important branches of entomology. In Nova Scotia excellent work has been done by Mr. John Russell, of Digby, N.S., who has added many species to those already recorded from the Maritime Provinces. Mr. Joseph Perrin, of Halifax, has also added to his previous laurels by collecting many rare species. Among those whose names are well known for the work they have done in connection with Canadian entomology, vigorous work has been continued during the past season in their various localities, by the Rev. G. W. Taylor, of Wellington, B.C., who continues his studies of the geometridæ, and who, although absent for the greater part of the summer on the Dominion Fishery Commission, has found time to name many collections which have been sent to him for identification. Mr. J. W. Cockle at Kaslo has added largely to his collection of Kootenai insects, and Mr. A. H. Bush, of Vancouver, has collected throughout the season and added several new names to the local list. In the foothills of the Rockies, Messrs. Thomas Baird, of High River, F. H. Wolley-Dod and F. A. Hudson, of Millarville, have done good work in unravelling difficulties connected with their interesting western fauna. In the Okanagan Valley Mr. E. P. Venables has made useful observations, in the prosecution of which he is now aided by his friend Mr. E. S. Wilmot, who has already taken some rare species, not previously recorded from the district. Mr. T. N. Willing has collected energetically in many parts of Saskatchewan and has accumulated much material in all orders. These are being worked up and will form a nucleus for a reference museum in connection with the Provincial Department of Agriculture, which will be of inestimable value

to farmers and others. In Manitoba Messrs. Criddle, Heath and Marmont have continued their work enthusiastically and have added very much to our knowledge of the insects of that province.

#### LITERATURE.

Among the many valuable works, reports and separate papers of interest to Canadian students of insects, which have been received during the past year, special mention may be made of the following:—

CARY, Merritt. The Diurnal Lepidoptera of the Athabasca and McKenzie Region. (Proc. U. S. N. M., Vol. XXXI, pp. 425-457). This paper will be of special value to our western members. It gives as complete a list as can as yet be compiled. The facts are taken from published lists and also from the collections of the author while making a biological exploration in the north during the summer of 1903, and of Mr. E. A. Preble in 1903 and 1904. Other species will doubtless be added to this list, but it is an excellent starting point for future work. Great care has evidently been taken to give full credit to all who have done anything, however little, in working up the diurnals of this little known region.

CASEY, Thos. L. Observations on the Staphylinid Groups, *Aleocharinæ* and *Xantholinini*, chiefly of America. (Trans. Academy of Sciences of St. Louis, pp. 125 to 434.) Coleopterists will note with great pleasure that Major Casey is again at work in the Staphylinidæ, a group of insects in which he has done such magnificent work. The present monograph covering particularly the two extremely difficult sub-families mentioned, will give a stimulus to North American collectors who have required just such a revision as is now provided to work up their material.

FELT, E. P. Insects Affecting Park and Woodland Trees. (Memoir VIII, N. Y. State Museum; 4to, Albany, 1905, pp. 332, plates 48, 20 coloured.) This sumptuous volume is printed on the best of paper, and everything is carried out as well as can be done by skilful printers and binders, a fit setting for the care and skill devoted to its preparation by Dr. Felt and his assistants. It brings together the results of many years' work and is supplementary to Dr. Packard's Forest and Shade-tree Insects. The letter-press is well prepared so as to be of the greatest use to the large number who will consult this work, but who are not trained entomologists. The entomologist, however, will also find that much care has been exercised in the identification of all species mentioned and in working up accurately the life-histories presented. The plates are of unusual beauty; Dr. Felt seems to have the same ideal as actuated Sir Edwin Landseer, who never portrayed in his pictures any animal that was not a thoroughbred or which was not in the best of condition. Dr. Felt's insects, even when reproduced by photography, are not only perfect, but have been set and prepared for reproduction with the greatest care. Some of the plates illustrating moths are probably unsurpassable in this respect.

FERNALD, Henry T. The Digger Wasps of North America and the West Indies belonging to the sub-family Chloroninæ. (Proc. U. S. N. M., Vol. XXXI, pp. 291-423, 5 plates.) Dr. Fernald has brought a well-trained mind to bear upon the difficult task which he set himself and has done his work in such a way as to deserve the thanks of all hymenopterists. All the extensive collections in the United States have been examined, and all types so far as known have been studied. It is to be hoped that more students will devote themselves to these interesting insects now that this further help has been added to existing literature.



FOLSOM, J. W. Entomology with Special Reference to its Biological and Economic Aspects. (P. Blakiston's Son & Co., Philadelphia, 485 pp., with five plates (one coloured) and 300 text figures, \$3.00.) The number of works in the entomologist's working library is already very large, but few active workers will be able to do without Dr. Folsom's recently issued magnificent work. In Packard's Guide, Comstock's Manual, and Kellogg's American Insects, classification is the prevailing idea, and is most useful and necessary; but in the present work the main object has been to supply in a concise form biological data. Familiar insects are used and the work is copiously illustrated with figures of the highest class. A short chapter on Classification, consisting of only 26 pages, begins the work. This, it may be thought, might have been extended to possibly twice its length with advantage. Chapter 2 on Anatomy and Physiology treats the subject in a delightful and fascinating manner. The same may be said of the next chapter on Development, in which typical insects only are dealt with in a suggestive manner. The titles of the remaining chapters are well chosen and the subjects effectively treated. They will be read with the greatest pleasure by all. Adaptations of aquatic insects, Colour and Coloration, Insects in relation to plants and to other animals, The Inter-relations of Insects, and Insects in relation to man, are subjects well dealt with in a concise and plain way, which can be understood by students. We believe that this work will do much to render the science of entomology much more popular than it must be acknowledged it has been in the past among students of agricultural colleges and others, notwithstanding the enormous economic importance of the subject, as shown by the annual losses in staple crops.

PACKARD, A. S. Monograph of the Bombycine Moths of North America, Part II, Ceratocampidæ. (Memoir IX, National Academy of Sciences, Washington, D.C., 1905, 4to, pp. 149, 61 plates, 24 coloured.) This is a most valuable work, giving full life-histories of the Ceratocampid moths of North America. The subject is treated of in Dr. Packard's masterly manner, and the plates, which are most beautiful, have been drawn by Messrs. J. Bridgham and L. H. Joutel, or are reproduced from photographs by Mr. A. H. Verrill. In looking through this work, we are sadly reminded that Dr. Packard's death removes one whose name has been such a watch-word for good work in American entomology and takes a shining light from the ranks of the leading American scientific men who have done so much to uphold the standard of scientific excellence on this continent. The coloured illustrations, which are chromolithographs by A. Hoen & Co., of Baltimore, are simply exquisite, and the whole work supplies one of the most beautiful additions to the literature of the Lepidoptera of North America which has ever appeared. It is to be hoped that the National Academy may authorize Dr. Harrison G. Dyar or some of the many other accomplished lepidopterists of the United States to give to the public similar Memoirs upon other North American moths.

SMITH, J. B. Explanations of the Terms used in Entomology. (Published by the Brooklyn Entomological Society, Brooklyn, N.Y., price \$2.00.) This most useful work, which perhaps answers more exactly to the trite expression that "it fills a long-felt want" than any recent publication, will provide many entomologists with a handy book of reference, which will enable them to understand the many useful, but in many instances unnecessary, unfamiliar terms which they frequently find in reading books dealing with the study of insects. This volume contains over 150 pages and explains between four and five thousand terms of more or less frequent use. One cannot read a page without feeling that many words have been made

use of by writers without any special need, and in some instances with the result of bewildering the reader without any compensating advantage. Four plates at the end of the work show structural details of the external body wall of some typical insects and the best known colours. As plates were given at all, it seems almost a pity that one or two more were not added, particularly one showing the markings and venation of the noctuidæ and some other orders in which Dr. Smith is the recognized authority. This handy little glossary will be found indispensable to all college students and other extensive readers of entomological literature.

The following is a list of the names and addresses of collectors heard from during 1906:—

- Anderson, E. M., Prov. Museum, Victoria, B.C.  
Baird, Thomas, High River, Alta.  
Baker, Arthur, Harding Hall College, London, Ont.  
Baldwin, J. W., 74 Besserer Street, Ottawa, Ont.  
Bethune, Rev. Prof., O. A. C., Guelph, Ont.  
Bryant, Theo., 2044 3rd Ave. W., Vancouver, B.C.  
Bush, A. H., 1105 Ninth Ave., Vancouver, B.C.  
Chagnon, Gus., Box 186, Montreal, Que.  
Cockle, J. W., Kaslo, B.C.  
Cosens, A., Jamieson Ave., Coll. Inst., Toronto, Ont.  
Criddle, Norman, Treesbank, Man.  
Denny, Edward, 200 Mitcheson St., Montreal.  
Dod, F. H. Wolley-, Millarville, Alta.  
Draper, R., Mt. Pleasant, Vancouver, B.C.  
Evans, J. D., Trenton, Ont.  
Fyles, Rev. T. W., Levis, Que.  
Garrett, C., Calgary, Alta.  
Gibbon, Hugh, Miniota, Man.  
Grant, C. E., Orillia, Ont.  
Hahn, Paul, Roxborough Ave., Toronto.  
Halkett, A., Fisheries Museum, Ottawa.  
Hanham, A. W., Duncans, B.C.  
Harrington, W. H., P. O. Dept., Ottawa.  
Harvey, R. V., Queen's School, Vancouver, B.C.  
Heath, E. F., Cartwright, Man.  
Hudson, A. F., Millarville, Alta.  
Jarvis, T. D., O. A. C., Guelph, Ont.  
Jones, W. A. Dashwood-, New Westminster, B. C.  
Keele, Jos., Geological Survey, Ottawa.  
Keen, Rev. J. H., Metlakatlah, B.C.  
Lambe, L. M., Geological Survey, Ottawa.  
Lyman, H. H., 74 McTavish St., Montreal.  
McIntosh, W., Nat. His. Soc'y., St. John, N.B.  
Marmont, L. E., Rounthwaite, Man.  
Metcalf, W., 288 Bank Street, Ottawa.  
Mitchell, Arch., Dep. of Agriculture, Edmonton, Alta.  
Moore, W. H., Scotch Lake, N.B.  
Moore, G. A., 209 Prince Arthur St., Montreal.  
Perrin, Jos., McNab's Island, Halifax, N.S.  
Russell, John, Digby, N.S.  
Sanson, N. B., Banff, Alta.  
Saunders, Henry, 21 Harbord St., Toronto.  
Sherman, R. S., 2285 Sixth Ave., Vancouver, B.C.



Simpson, Willibert, Dom. Observatory, Ottawa.  
 Stevenson, Chas., 906 St. Urbain St., Montreal.  
 Taylor, Rev. G. W., Wellington, B.C.  
 Venables, E. P., Vernon, B.C.  
 Walker, Dr. E. M., 99 St. George St., Toronto.  
 Wallis, J. B., Office of Sup. Schools, Winnipeg, Man.  
 Williams, J. B., 236 Bloor St. E., Toronto, Ont.  
 Willing, T. N., Regina, Sask.  
 Wilmot, E. S., Vernon, B.C.  
 Wilson, W. J., Geological Survey, Ottawa.  
 Winn, A. F., 132 Springfield Ave., Westmount, Que.  
 Young, C. H., Hurdman's Bridge, Ont.  
 Zavitz, E. J., O. A. C., Guelph, Ont.

## NOTES OF CAPTURES.

### LEPIDOPTERA.

(Arranged according to Dyar's List of North American Lepidoptera, U. S. N. M. Bull. No. 52.)

### RHOPALOCERA.

(Dyar's number.)

51. *Callidryas philea*, L. St. John, N.B., Sep. 17, perfect specimen taken on dahlia blossoms, (McIntosh). This is the first Canadian record of this southern insect.
70. *Eurymus alexandra*, Edw., b. *emilia*, Edw. Kaslo, B. C., male and female seen but not captured, Aug. 19, (Cockle); Kalso, July 22, 1897, (Danby).
92. *Euptoieta claudia*, Cramer. Westmount, Que., one specimen seen Sept. 8, (Winn).
207. *Polygonia satyrus*, Edw. St. John, (McIntosh). The form *marsyas* was taken at Digby, N.S., by Mr. J. Russell.
223. *Junonia cœnia*, Hbn. Orillia, Ont., second specimen taken here, July, (Grant).
264. *Cercyonis ætus*, Bdv. Tranquille, B. C., July 7, (Lambe).
374. *Incisalia irus*, Godt, var. *arsace*, Bdl-Lec. Digby, N. S., 4 sps., May 5 to 22, (Russell).
383. *Erora læta*, Edw. Digby, June 7, (Russell).
463. *Amblyscirtes samoset*, Scudd. MacNab's Island, Halifax, N.S., quite abundant, (Perrin).

### HETEROCERA.

661. *Lepisesia juanita*, Strk. A male in perfect condition, hovering over a thistle head in hot sunshine near Red Deer River, about 50 miles north-east of Gleichen, on July 6, 1905; agrees with Strecker's description, and is apparently the first record for Canada, (Dod).
674. *Arges labruscæ*, L. St. John, Aug. 25, at light, (McIntosh). This is the only known Canadian record of this magnificent southern hawk moth.
704. *Sphinx luscitiosa*, Clem. Digby, N.S., July 15, 16, (Russell); Aweme, Man., May 27, June 10, 17, (Criddle). Montreal, July 17, (Can Ent. 38, p. 59).

778. *Basilona imperialis*, Drury. Ross Mount, Ont. Two perfect specimens, male and female, of this handsome moth, which is rare in Canada, were recently taken at the above place by Mr. T. W. Ramm, and presented to the Division of Entomology.
846. *Ecpantheria deflorata*, Fab. Niagara Glen, Ont., two larvæ, Sept. 18 and 20, one found feeding on violets, (Williams).
859. *Isia isabella*, S. & A. Kaslo, July 16, 2nd specimen taken by me here, the 1st in 1891, (Cockle).
875. *Apantesis virguncula*, Kirby. Milton, N.S. July 6, (W. H. Moore).
880. *Apantesis anna*, Grt. Niagara Glen, (Hahn).
961. *Demas propinquinelinea*, Grt. MacNab's Island, Halifax, Feb. 11, (Perrin).
964. *Charadra deridens*, Gn. This handsome noctuid has this year been reported from several localities: Cartwright, Man., June 15, (Heath); Ottawa, June 22, (Young); June 4, (Fletcher); Digby, June 28, (Russell).
- 1,006. *Apatela tritona*, Hbn. MacNab's Island, Halifax, July 2, (Perrin).
- 1,008. *Apatela funeralis*, Grt. St. John's, Que., July 1, (Chagnon); Ottawa, (Young, Fletcher); Toronto, (Gibson).
- 1,149. *Hadena bridghami*, G. & R. Digby, Aug. 22, (Russell). St. John Aug. 20, (McIntosh).
- 1,153. *Hadena claudens*, Wlk. Kaslo, Aug. 28, (Cockle); Aweme, Man., Aug. 24, (Criddle & Fletcher).
- Hadena ferens*, Sm. Calgary, Alta., at light, July, 12, (Hudson).
- 1,189. *Hadena barnesii*, Sm. Kaslo. July 28, (Cockle).
- 1,212. *Hadena passer*, Gn. Digby, July 9, (Russell); Kaslo, July 21, (Cockle).
- Hadena rorulenta*, Sm. MacNab's Island, Halifax, July 5, (Perrin); Ottawa, June 23, (Young); Digby, June 29, (Russell).
- 1,228. *Hadena plutonia*, Grt. Meach Lake, July 17, (Young). First record for the Ottawa district.
- 1,230. *Hadena ducta*, Grt. Massett, Q. C. I., July 9, (Keen).
- 1,298. *Heliotropha obtusa*, Sm. Aweme, Aug. 19, (Criddle). Described from New Hampshire; never saw it since, (J. B. Sm.).
- 1,312. *Homohadena badistriga*, Grt., var. *ffia*, Dyar. Kaslo, July 3, (Cockle).
- 1,345. *Oncocnemis glennyi*, Grt. Vernon, (Bush).
- 1,356. *Oncocnemis barnesii*, Sm. Kaslo, Aug. 19, (Cockle). The third known specimen.
- 1,359. *Oncocnemis balteata*, Sm. Aweme, Aug. 11, 22; Sep. 1, (Criddle). A rare and beautiful species.
- 1,390. *Rhynchagrotis rufpectus*, Morr. Ottawa, Aug. 9, (Young).
- 1,429. *Semiophora youngii*, Sm. Digby, N.S., Aug. 28, (Russell).
- 1,477. *Noctua esurialis*, Grt. Vancouver, B.C., July 20, (Bush).
- 1,480. *Noctua conchis*, Grt. Regina, Sask., July 11, (Willing).
- 1,484. *Noctua phyllophora*, Grt. Ottawa, June 22, (Fletcher); Digby, July 7, Aug. 3 (Russell); MacNab's Island, Halifax, July 15, 20, (Perrin).
- 1,492. *Noctua juncta*, Grt. Millarville, Alta., July 17, (Hudson).
- 1,560. *Pronoctua typica*, Sm. Kaslo, Sept. 9, (Cockle).
- 1,530. *Rhizagrotis albicosta*, Sm. High River, (Baird).
- 1,531. *Rhizagrotis flavicollis*, Sm. High River, Alta., (Baird).



- 1,533. *Rhizagrotis lagena*, Grt. A pair on Red Deer River, July 1 and 3, at snowberry flowers at dusk, (Dod & Hudson).  
*Paragrotis maimes*, Sm. Calgary, common at light in early August; scarce for years past, (Dod & Hudson); High River, (Baird).  
*Paragrotis vestitura*, Sm. Can. Ent. XXXVII., p. 20. St. John, usually rather abundant in August. It was from my specimens that Dr. Smith described the species, (McIntosh). McNab's Island, Halifax, Aug. 12, (Perrin).
- 1,579. *Paragrotis plagigera*, Morr. Spatsum, B.C., July 26, (Bush).
- 1,611. *Paragrotis acornis*, Sm. Calgary, Sep. 19, one at light, (Dod); High River, (Baird).
- 1,623. *Paragrotis detersa*, Wlk. The white larvæ almost identical in appearance with those of *Paragrotis scandens* were common around clumps of *Salsola Kali* and *Cakile Americana* on the sandy beach at Youghall, N.B., in July, (Fletcher).
- 1,697. *Paragrotis dissona*, Moschler. Banff, Aug. 10, (Sanson); Field, B. C., July 24, (Bush).
- 1,721. *Paragrotis furtivus*, Sm. Vancouver, July 11, (Bush); High River, (Baird).
- 1,731. *Paragrotis acutifrons*, Sm. Cartwright, July 17, one at sugar, (Heath).
- 1,732. *Paragrotis nordica*, Sm. Cartwright, July 11 and 17, at sugar, (Heath).
- 1,785. *Mamestra distincta*, Hbn. Meach Lake, Que., May 16, (Young).
- 1,788. *Mamestra liquida*, Grt. Kaslo, June 27, (Cockle).
- 1,804. *Mamestra larissa*, Sm. Aweme, June 3, (Criddle). *Teste* Dod.
- 1,806. *Mamestra rubefacta*, Morr. Digby, June 18, (Russell).
- 1,808. *Mamestra cristifera*, Wlk. Meach Lake, July 10, (Young).
- 1,809. *Mamestra assimilis*, Morr. Ottawa. Four mature larvæ found feeding on common St. John's-wort, *Hypericum perforatum*, Sept. 22, 1905. Emerged June 7, 1906, (Gibson).
- 1,851. *Mamestra pensilis*, Grt. Aweme, July 6 and 26, (Criddle). *Teste* Dod.  
*Mamestra obesula*, Sm. Calgary, a few at light, July 12 to 25, (Dod & Hudson); Rosthern, Sask., July 21, (Willing).
- 1,882. *Barathra curialis*, Sm. This interesting species, which was so abundant in Canada during 1905, and which was mentioned in last year's Entomological Record, under the name *Barathra occidentata*, Grt., has again appeared in small numbers in some localities. Mr. Lyman and Mr. Winn report having taken it at Montreal in June; and Mr. Perrin, of MacNab's Island, Halifax, captured it on June 25, 27, and July 4.
- 1,906. *Scotogramma submarina*, Grt. About 8 specimens at snowberry flowers, at dusk, on Red River, July 1-4, (Dod & Hudson).
- 1,910. *Scotogramma uniformis*, Sm. Field, July 25, (Bush); Banff, July 16, (Sanson).
- 1,918. *Scotogramma conjugata*, Sm. Vancouver, taken from a railway car, July 7, (Bush).
- 1,941. *Anarta zetterstedti*, Staud. Field, B.C., July 25, (Bush).
- 1,965. *Heliophila diffusa*, Wlk. Aweme, June 17, (Criddle). *Teste* Dod.
- 2,000. *Orthodes irrorata*, Sm. Vancouver, June 29, July 16, (Bush).
- 2,042. *Graphiphora rubescens*, Wlk. Ottawa, April 23, 25, (Young).
- Fishia exhilarata*, Sm. Kaslo, Oct. 10, (Cockle).

- 2,077. *Lithomoia germana*, Morr. Kaslo, Aug. 25; a new record for the interior of British Columbia, (Cockle).
- 2,086. *Xylina hemina*, Grt. Aweme, Apl. 23, and Sept., (Criddle). *Teste* Dod.
- 2,096. *Xylina amanda*, Sm. Aweme, Sept. 19, Oct. 1, (Criddle). *Teste* Dod; Miniota, Man., (Gibbon).
- 2,107. *Xylina tepida*, Grt. MacNab's Island, Halifax, Apl. 17, (Perrin); St. John, (McIntosh).
- 2,113. *Xylina capax*, G. & R. Cartwright, (Heath). *Teste* Dyar.  
*Xylina fletcheri*, Sm. Meach Lake, Sept. 6, 7, (Young).
- 2,168. *Gortyna medialis*, Sm. Calgary, a worn male at light, Sep. 19, very rare of recent years, (Dod).  
*Gortyna pallescens*, Sm. Kaslo, Aug. 25, the only specimen taken since 1892, (Cockle). It is possible that Mr. Dod's specimen should be referred here.
- 2,175. *Papaipema harrisii*, Grt. var. Reared in some numbers from larvæ boring in the base of fronds of *Pteris aquilina*, Meach Lake, Aug., (Young). These larvæ were much parasitised.
- 2,191. *Papaipema appassionata*, Harvey. Reared from the roots of *Sarracenia purpurea*, Meach Lake, Aug., (Young). Many larvæ parasitised by *Masicera myoidea*. This most beautiful species is still very rare in collections.
- 2,213. *Tapinostola orientalis*, Grt. Calgary, two specimens at light, Sept. 8, (Hudson).
- 2,284. *Tapinostola variana*, Morr. Meach Lake, one specimen, July 7, (Young). A new record for Ottawa district.
- 2,473. *Polychrysis formosa*, Grt. MacNab's Island. Halifax, Aug. 17, (Perrin); St. John, July 19, (McIntosh).
- 2,516. *Autographa surena*, Grt. Quebec, Que., Aug. 12, 1902, (Hahn).
- 2,501. *Autographa alias*, Ottol. Dr. Ottolengui writes, "this species is found in nearly all collections under the name of *u-aureum*, a European species, the description of which does not fit anything in this country." Specimens have been received from St. John, (McIntosh); Halifax, (Perrin), and Ottawa, (Young).
- 2,503. *Autographa altera*, Ottol. McNab's Island, Halifax, (Perrin). Dr. Ottolengui writes: "The type of *altera* came from Nepigon, and I have a second specimen from the Adirondacks. Mr. Perrin's is the third. I am much interested in this specimen, because, being grayer than mine, it looks more like *variana*, but, placed between the types of these two species, which Dr. Dyar thought would prove to be the same, the specimen only emphasizes the fact, that both are species.
- 2,514. *Autographa celsa*, Hy. Edw. Vancouver, July 29, (Bush).
- 2,522. *Autographa excelsa*, Ottol. Sable Island, Aug. 19, 1899, (John Macoun). "I have been told that this species is not separable from *angulidens*, described from Colorado; but I have had over a hundred specimens of that before me, and every one has the silver mark with prolongations close together, and turned inwardly forming a U. I took my first *excelsa* in New Hampshire, and received others from Wolley-Dod, of Calgary. All that do not come from Colorado, have thus far had the typical V instead of the U silver mark. The genitalia also differ. You may feel safe in calling anything like this from Colorado, *angulidens*, as it seems as local as *vaccinii*. All others are *excelsa*." (R. Ottolengui.)



- 2,781. *Syneda graphica*, Hbn. Hope Mts., B.C., July 17, (Harvey).
- 2,872. *Catocala cerogama*, Gn. Cartwright, Aug. 18 and 20, one each night; this is, I think, a record for Manitoba. (Heath).
- 2,886. *Catocala cælebs*, Grt. Digby, Aug. 14, (Russell).
- 2,990. *Homoptera minerea*, Gn. White River, Hudson Bay slope, June 2, (W. J. Wilson).
- 3,007. *Thysania zenobia*, Cram. Toronto, Sep. 19, (Hahn). This is the second record of this magnificent visitor from the South being taken in Canada.
- 3,150. *Schizura semirufescens*, Wlk. Vancouver, taken from railway car, July 28, (Bush); Cartwright, June 17, (Heath).
- 3,169. *Gluphisia lintneri*, Grt. Calgary, a male flying in sunshine, Apl. 19, (Hudson); Aweme, Apl. 18, 25, (Criddle); Ottawa, var. *arimacula*, Huds., May 23, (Young).
- 3,197. *Euproctis chrysorrhæa*, L. St. John, N.B., July 22, 1904, (A. Gordon Leavitt). The second Canadian record.
210. *Tolyte distincta*, French. Kaslo, Aug. 17, (Cockle).
225. *Eudeilinea herminiata*, Gn. One on July 5, on Red Deer River, (Dod).
- 3,233. *Cysteropteryx viridata*, Pack. Meach Lake, May 17, (Young).
- 3,259. *Carsia paludata*, Thunb. Hope Summit, 5,800 feet, July 19, (Harvey).
- 3,287. *Eupithecia latipennis*, Hulst. Meach Lake, June 15, (Young).
- 3,276. *Eupithecia ornata*, Hulst. Ottawa, Apl. 24, May 4, (Young).
- Eupithecia youngata*, Taylor. Ottawa, June 7, July 20, (Young). This species was described in the "Ottawa Naturalist" for March, 1906.
- Eupithecia casloata*, Dyar. Meach Lake, Aug. 5, (Young).
- 3,350. *Eustroma propulsata*, Wlk. (*R. packardata*, Lint.), a variety with antennæ dentate and probably in process of evolution towards a pectinated form. The ordinary form is simple ciliate. Frazer Falls, Y.T., Aug. 22, 1905, (J. Keele).
- 3,362. *Rheumaptera luctuata*, D. & S. a. *obductata*, Moesh, Lansing River, Y.T., June 24, (Keele).
- 3,425. *Cænocalpe polygrammata*, Hulst. A pair on Red Deer River, July 3 and 6, (Dod & Hudson). The first records for Canada, (G. W. Taylor).
- 3,695. *Cymatophora brunneata*, Thunb. Hope Mts., July 20, (Harvey).
- 3,709. *Cymatophora latiferrugata*, Wlk. Ottawa, emerged from pupa, Aug., larva on *Prunus pennsylvanica*; black, with conspicuous white spots on sides, (Fletcher). A distinct species from *C. pustularia*.
- 3,734. *Cymatophora denticulodes*, Hulst. Two males at light on Pine Creek, July 22 and 25, (Dod). Hope Mts. July 18, (Harvey). New to Canada. (G. W. Taylor.)
- 3,773. *Platea trilinearia*, Pack. Not uncommon on Red River bottom, north-east of Gleichen, amongst prairie sage, *Artemisia ludoviciana*, in early July, (Dod & Hudson). Mr. Taylor says that this species was not previously known from Canada, with the exception of a possibly erroneous "B.C." record.
- 3,902. *Sicya macularia*, Harr. Sturgeon River, West of the Tamagami Region, July 17, (W. J. Wilson).
- 3,909. *Therina athasaria*, Wlk. Meach Lake, June 17, (Young). The first record for the Ottawa district.

- 4,266. *Glaphria psychicalis*, Hulst. Trenton, one specimen, July 12, (Evans).  
 4,308. *Sylepta penumbralis*, Grt. Trenton, 4 specimens at light, May 17, Aug. 12, (Evans).  
 4,321. *Diaphania quadristigmalis*, Gn. Toronto, (Hahn).  
 4,323. *Metrea ostreonalis*, Grt. Meach Lake, July 16, very rare, (Young).  
 4,386. *Tholoria reversalis*, Gn. McNab's Island, July 10, 1904, (Perrin).  
 4,414. *Cindaphia bicoloralis*, Gn. Trenton, Aug. 20, at light, (Evans).  
 4,455. *Pyrausta generosa*, G. & R. Trenton, at light, May 27, (Evans).  
*Eurhynpara urticata*, L. Milton, N.S., July 6, 1906, (W. H. Moore). This common European species which feeds upon the stinging-nettle was first found by Mr. Moore, and was kindly identified by Dr. H. G. Dyar, who reported, "not known in North America." Since the receipt of Mr. Moore's specimens I have had an opportunity of examining Mr. Wm. McIntosh's collection in St. John, N.B., where I found several specimens of this moth. Mr. McIntosh tells me it is common in the district.  
 4,496. *Nymphula oblitalis*, Wlk. Trenton, 2 specimens, (Evans).  
 4,499. *Elophila bifascialis*, Rob. Trenton, 3 specimens, Aug. 14, (Evans).  
 4,519. *Herculia cohortalis*, Grt. Trenton, June 30, Aug. 6, (Evans).  
 4,544. *Schænobius tripunctellus*, Rob. Trenton, one specimen, June 25, at light, (Evans).  
 5,014. *Exartema zellerianum*, Fern. Trenton, July 19, (Evans).  
*Eucosoma confluana*, Kearf. Trenton, one specimen, at light, Aug. 24, (Evans).  
 5,287. *Ecdytolopha insiticiiana*, Zell. Trenton, 2 specimens, June 25, and Aug. 24, at light, (Evans).  
 5,336. *Cenopsis Pettitana*, Rob. Trenton, (Evans); Ottawa, larva on bass-wood, May 31; pupa, June 7; moth, June 16, (Gibson).  
 5,419. *Eulia quadrifasciana*, Fern. Trenton, two specimens, July 8 and 22, at light, (Evans).  
 5,818. *Gelechia omatiformbriella*, Clem. Trenton, at light, June 25, and July 7, (Evans).  
 5,865. *Depressaria psoralisella*, Walsm. Trenton, one specimen, at light, Sept. 5, (Evans).

The following valuable notes on some species of microlepidoptera have been received from Mr. W. D. Kearfott, and are gratefully included:

"Since the brief list of notable captures was written for the 1904 Entomological Record, I have had the privilege of examining a very large number of Canadian specimens, and mention the following as being especially interesting. Several of them are new records for Canada.

"This list could be continued almost indefinitely, but its usefulness is limited, because there is no strictly Canadian list of Lepidoptera. I would strongly urge the compilation of such a list. With such a basis to work from, the friendly rivalry to add names to it would be very much stimulated. I have records of several hundred names of Microlepidoptera, and my notes and help are freely offered to any one who may care to undertake this task.

"I desire again to extend my sincere thanks to the gentlemen who have so kindly sent me their material for examination and determination, and for their most generous treatment in the cases of unknown and desirable species, especially Messrs. Young, Criddle, Marmont, Heath, Evans, Willing, Dennis, Taylor, Saunders, Winn, Gibson and Fletcher.

- 4,569. *Crambus bidens*, Zeller. Specimens of both sexes from Mr. Young, Ottawa, July 11. Very rare as yet in general collections.



- 4,583. *Crambus myellus*, Hbn. Hurdman's Bridge, Ont., July 26-30. This species is recorded from Europe, Maine and Nova Scotia. It is very rarely met with, and Mr. Young's specimens are the first I have seen.
- 5,137½. *Eucosma suffusana*, Zell. This European species has never been recorded from America, but is likely to prove of considerable economic importance after a few years. I have recently received specimens for determination from several localities in New Jersey and Pennsylvania, Portsmouth, N.H., and Regina, Sask., (Willing), August 15. Early this spring I bred the moths from larvæ crumpling and rolling the young leaves of my rose bushes and eating the entire bud. The larva is transparent pinkish green, almost slug-like in shape. I have not had it from Eastern Canada; but it will be found wherever roses grow.
- 5,189. *Thiodia signatana*, Clem. Received from Mr. Gibson, and labelled "Miner in maple leaves, Kirk's Ferry, issued Sept. 18." This species is quite common in Montclair and, during June, can be found in abundance on the trunks of the red maple.
- The larvæ are found in September, living in a tube on the underside of the leaf, and still further protected by a web of silk across the leaf, from edge to edge. It would be interesting to know if its habits are different at Kirk's Ferry; possibly the term "Miner" referred only to the young larvæ, immediately out of the ova.
- 5,298. *Carpocapsa toreuta*, Grote. One specimen received through Dr. Fletcher, labelled "Bred from cone of *Pinus ponderosa*, British Columbia (Interior), (J. R. Anderson)." This is another very rare species; only one or two other specimens are known.
- 5,325. *Acleris angusana*, Fern. Hurdman's Bridge; bred from larvæ webbing the leaflets of hemlock. Mr. Young sent me eight specimens, exhibiting a great range of variability; a narrow band from base to apex connects them all; but this band ranges from pure white, through the reds to black. The ground color, likewise, in different specimens, ranges from pale yellow, through the reds to purplish black, and in some of the specimens a white transverse angulated band through the middle of the wing; in others, the outer half is paler than the inner. On p. 849, Fifth Report Ento. Comm., Packard records the breeding of this species from spruce and fir, but calls it Var. "E" of *Teras variana*, Fern.
- 5,475. *Carposina crescentella*, Wlsm. Hurdman's Bridge, (Young); locality "unknown" in Dyar's list; it has also been taken in Western Pennsylvania, (Merrick).
- 5,488. *Periclymenobius canariellus*, Wlsm. Hurdman's Bridge, (Young); Rounthwaite, (Marmont). The three species under this genus can easily be recognized by the scythe-like extension of the cilia of the apex of the fore wings, making them veritable hook-tips; I believe all three will be found in Canada from Ottawa westward. I have already recorded *P. frustellus* from Aweme, (Criddle), and Cartwright, (Heath), and also have *canariellus* from Wellington, B.C., (Taylor) and Arizona, (Kunze).
- 5,518. *Euclेमensia bassettella*, Clem. Hurdman's Bridge, (Young).
- This is one of the most beautiful of the larger Tineids, a long bar of crimson on an opalescent-black back-ground. It has been

bred from larvæ feeding within small yellowish brown, shining galls on twigs of oak. I do not believe this larva is the cause of the gall, but it makes use of the habitat of a generous (?) Dipteran.

#### ADDITIONS TO THE MANITOBA LIST.

- 4,521. *Herculia olinalis*, Gn. Aweme, VII., 26 to VIII., 6.
- 4,566. *Crambus unistriatellus*, Pack. Aweme, VIII., 17.
- 4,737. *Nephopteryx hypochalciella*, Rag. Aweme VIII., 16.
- 4,871. *Homæosoma mucidellum*, Rag. Aweme, VI., 12.
- 4,965. *Pterophorus subochraceus*, Wlsm. Aweme, VI., 12.
- 5,018. *Exartema versicoloranum*, Clem. Aweme, VII., 12-15.
- 5,022. *Exartema corylanum*, Fern. Aweme, VII., 6-12.
- 5,071. *Olethreutes bipartitana*, Clem. Aweme, VI., 21 to VII., 5.
- 5,073. *Olethreutes impudens*, Wlsm. Aweme, VII., 27.
- 5,132. *Eucosma hirsutana*, Wlsm. Aweme, VI., 14 to VII., 4.
- 5,150. *Eucosma carolinana*, Wlsm. Cartwright.
- 5,255. *Ancylis divisana*, Walk. Aweme, VI., 26-27.
- 5,274. *Enarmonia lunatana*, Wlsm. Aweme, V, 18 to VI., 7.
- Ancylis cockleana*, Kearf. Aweme, VII., 20.
- 5,339. *Cenopsis groteana*, Fern. Winnipeg, Hanham.
- 5,407. *Tortrix packardiana*, Fern. Aweme, VI., 12.
- 5,834. *Stenoma schloegeri*, Zell. Aweme, VI., 21.
- 5,912. *Ethmia longimaculella*, Cham. Aweme, VI., 21.
- 6,108. *Scythris eboracensis*, Zell. Aweme, VI., 27 to VII., 7.

W. D. K.

The following species of geometridæ have been described in the "Canadian Entomologist" for 1906, by the Rev. G. W. Taylor, of Wellington, B.C., from different parts of Canada.

*Eupithecia régina*. Regina, Sask., June 25, (Willing); Calgary, June 29, July 7, to Aug. 8. (Dod).

*Eupithecia alberta*. Calgary, June 30, (Dod).

*Eupithecia dodata*. Calgary, June 26, and July 3, (Dod).

*Eupithecia adornata*. Calgary, May 25, to June 14, (Dod).

*Xanthorhoe circumvallaria*. Millarville, June 26, July 24, (Dod).

*Aplodes hudsonaria*. Fifty miles N.E. of Gleichen, Alberta, July 7, (Hudson); Victoria, August, 1903, (Hanham).

*Eupithecia olivacea*. Wellington, April 7, 1903, (Taylor); not uncommon at Vancouver (Harvey).

*Eupithecia harveyata*. Vancouver, Apl. 6, 1903, (Harvey).

*Eupithecia dyarata*. Kaslo, Apl. 24, not uncommon, (Cockle).

*Eupithecia hanhami*. Victoria, June, (Hanham).

*Eupithecia bryanti*. Stickeen River, B.C., July, (Bryant).

*Eupithecia obumbrata*. Victoria, April to June, (Hanham).

*Eupithecia modesta*. Vancouver, June 6, (Taylor).

*Eupithecia insignificata*. Wellington, Victoria and Vancouver, March to May, (Taylor).

*Eupithecia sublineata*. With above, and thought to be a variety of it.

*Eupithecia perbrunneata*. Kaslo and Victoria, May 9 to June 2, (Cockle and Taylor).

*Eucymatoge vancouverata*. Wellington, Vancouver.

*Eustroma harveyata*. Kaslo, Stickeen River, Vancouver.

*Zenophleps victoria*. Victoria, (Hanham).

*Hydriomena autumnalis*, Strom., var. *columbiata*. Victoria, Wellington, May.



*Hydriomena manzanita*. Wellington, April.

*Xanthorhoe pontiaria*. Wellington; Salem, Oregon.

*Xanthorhoe fossaria*. Laggan, Alta., and Mt. Cheam., B.C., (Bush).

*Leptomeris subfuscata*. Victoria, (Hanham); Vernon, (Harvey).

*Deilinia bryantaria*. Stickeen River, June 13, (Bryant).

*Enypia packardata*. Wellington, June to August.

Several species of European geometridæ have been recognized in Canada, for the first time during the year, viz.

*Eupithecia castigata*, Hbn. Wellington, (Taylor); Calgary, (Dod).

*Eupithecia togata*, Hbn. Wellington, (Taylor).

*Hydriomena ruberata*, Freyer. Calgary, (Dod).

*Himera pennaria*, L. Tamarisk, Man., 1903, (L. Fanshawe).

#### COLEOPTERA.

(Arranged according to Henshaw's List of the Coleoptera of America, North of Mexico.)

36. *Cicindela cinctipennis*, Lec. Vernon, B.C., May, one specimen on damp sand, (Venables).
109. *Cyehrus angulatus*, Harr. Duncans, B.C., April, (Hanham).
871. *Lebia devisa*, Lec. Regina, April 15, (Willing).
898. *Lebia depicta*, Horn. Regina, Oct. 11, (Willing).
- 1,487. *Dytiscus circumcinctus*, Ahr. Winnipeg, "On a sultry evening in October my son Evan collected about 100 specimens, half of them males; of the females four had sulcate elytra. Prof. Wickham who named my specimens, writes: 'The first American specimens I have seen. The original American locality is Red River, and they may have come from Winnipeg,' (Evans).
- 2,661. *Boletobius cincticollis*, Say. Aweme, in woods, April 9, (Criddle).
- 2,829. *Olophrum marginatum*, Kirby. Sudbury, one specimen, (Evans).
- 2,899. *Siagonium americanum*, Melsh. Sudbury, one specimen, (Evans).
- 3,696. *Epuræa helvola*, Er. Aweme, at putrid bird, June 3, (Criddle).
- 3,984. *Aræopus monachus*, L. Vernon, on willow blossom, (Venables).
- 4,005. *Holodes thoracica*, Guer. Como, Que., July, Aug., (G. A. Moore).
- 4,275. *Ludius abruptus*, Say. Ottawa, June 20, (Fletcher).
- 9,394. *Chrysobothris ludificata*, Horn. Aweme, April 10, July 16, (Criddle).
- 5,022. *Malachius aneus*, L. Ottawa, June 6, (Fletcher); July 1, (J. A. Guignard). An addition to the Ottawa list.
- 5,177. *Clerus nigriventris*, Lec. Vernon, on pine stump, July 15, (Venables).
- 5,359. *Dinoderus substriatus*, Payk. Barrie, Ont., in hemlock bark, Oct., (Zavitz).
- 5,384. *Hylecætus lugubris*, Say. Fort Kent, Maine, 1900, opposite St. Francis, N.B., (Rev. F. X. Burque).
- 5,525. *Aphodius fatidus*, Fab. Aweme, April 26, May 4, (Criddle).
- 5,961. *Prionus californicus*, Mots. Grierson's Wharf, on the Ottawa near Fitzroy Harbour, July 30, (Metcalf). A wanderer from the Pacific Coast.
- 6,079. *Tylonotus bimaculatus*, Hald. Guelph, on black ash, July, (Zavitz).
- 6,106. *Ancylocera bicolor*, Oliv. Ridgeway, on hickory, Aug., (Zavitz).
- 6,238. *Toxotus schaumii*, Lec. Galt, on maple, August, (Dr. Bethune).
- 6,304. *Leptura subhamata*, Rand. Guelph, August, (Zavitz).
- 6,345. *Leptura biforis*, Newm. Ridgeway, August, (Zavitz).
- 6,385. *Monohammus titillator*, Fab. Rondeau and Ridgeway, on white pine, June to August, (Zavitz).
- 6,397. *Goes pulchra*, Hald. Ridgeway, on hickory, August, (Zavitz).

- 6,577. *Crioceris asparagi*, L. Ottawa, larvæ found Sept. 20, buried Sept. 22, emerged at end of October; the furthest eastern record in Ontario, (Fletcher & Gibson). Not previously found at Ottawa.
- 7,396. *Cælocnemis dilaticollis*, Mann. Vernon, June, (Wilmot).
- 7,852. *Mordellistena bihamata*, Melsh. Como, Que., June and August, (G. A. Moore).
- 7,873. *Stereopalpus mellyi*, Laf. Como, July and August, (G. A. Moore).
- 8,101. *Epicauta fissilabris*, Lec. Saskatoon, June 6, (Willing).
- 8,611. *Magdalis perforata*, Horn. Ridgeway, Aug., on white pine, (Zavitz).
- 8,619. *Magdalis subtinctoria*, Lec. Greenbush, Man., bred from twigs of white spruce, March 4, (Willing).
- 8,634. *Anthonomus profundus*, Lec. Trenton, one specimen, Sept. 27, '03. This has not been so far reported from Canada, (Evans).
- 9,203. *Gonotropis gibbosus*, Lec. Aweme, April 29, (Criddle).
- 9,748. *Cryptorhynchus lapathi*, L. Ridgeway and Beamsville, June 23 to July 30, (Zavitz). Toronto, on one willow only in High Park, but this was completely riddled, (A. Cosens). This destructive weevil which attacks poplars and willows is gradually spreading through North America. These are the first Canadian records.

## DIPTERA.

(Arranged according to a Catalogue of North American Diptera by J. M. Aldrich. Smithsonian Misc. Coll., XLVI, No. 1, 444. The numbers refer to the pages of the Catalogue.)

171. *Bibiocephala grandis*, O. S. Hope Mts., B.C., July 14, (Harvey).
196. *Chrysops delicatulus*, O. S. St. John, July 2, (McIntosh).
196. *Chrysops frigidus*, O. S. Hope Mts., July 18 to 27, (Harvey).
198. *Chrysops proclivus*, O. S. St. John, July 21, (McIntosh).
203. *Tabanus fratellus*, Will. Hope Mts., July 18 to 25, (Sherman).
- Tabanus osburni*, Hine. Hope Mts., July 12 to 25, abundant, (Sherman and Harvey).
209. *Tabanus zonalis*, Kby. Kaslo, (Cockle).
227. *Dipalta serpentina*, O. S. Goldstream, B.C., Aug. 19, (Harvey).
- Anthrax harveyi*, Hine. Hope summit, 5,800 feet, seven specimens, July 20 and 24, (Sherman and Harvey).
241. *Eclimys harrisii*, O. S. St. John, (McIntosh).
256. *Stenopogon modestus*, Lw. Similkameen, July 21, 22, common, (Sherman and Harvey).
258. *Dicolonus simplex*, Lw. Victoria, June 8, (Harvey).
259. *Cyrtopogon aurifex*, O. S. Hope Mts., July 12 to 27, common, (Sherman and Harvey).
259. *Cyrtopogon dasylloides*, Will. Kaslo, (Cockle).
296. *Hydrophorus innotatus*, Lw. St. John, (McIntosh).
383. *Pyritis montigena*, Hunter. Vancouver, Feb. to Apl., (Sherman).
386. *Eristalis inornatus*, Lw. St. John, June 5, (McIntosh).
- Merodon equestris*, Fab. Vancouver, several specimens, (Harvey).
401. *Crioprora alopecus*, O. S. Vancouver, March 24, (Sherman).
405. *Temnostoma aequalis*, Loew. Haydon, Ont., July 31, (E. B. Williamson).
412. *Myopa pictipennis*, Will. Vancouver, April 14, (Harvey).
- Cuterebra grisea*, Coq. Hope Mts., July 12, (Sherman).
419. *Cuterebra tenebrosa*, Coq. Kaslo, July 20, (Cockle), Vernon, July, (Wilmot). A magnificent blue-black species nearly an inch long and almost one-half inch across the abdomen.



422. *Cistogaster immaculata*, Macq. Hope Mts., July 15, (Harvey).  
 466. *Masicera myoidæa*, Desv. Meach Lake, bred from *Papaipema apassionata*, (Young).  
 527. *Mesembrina splendens*, Wahl. Kaslo, (Cockle).  
 605. *Trypeta straminea*, Doane. Wellington, July, 1904, (Harvey).  
 608. *Carphotricha culta*, Wied. Wellington, June, 1905, (Harvey).  
 611. *Tephritis albiceps*, Lw. Victoria, June 8, (Harvey).

#### HEMIPTERA.

We are glad to note an awakening of interest in this important order. Collections have been submitted to Mr. E. P. Van Duzee and kindly named by him, from Mr. W. J. Palmer, of Buffalo, the Rev. G. W. Taylor, of Wellington, B.C., and Mr. G. A. Moore, of Montreal. A list of Mr. Palmer's collection taken near Lake Temagami, Ont., appears in the *Canadian Entomologist* for 1906 at page 406. Some of Mr. Taylor's new species are described in *Entomological News* for Dec., 1906, page 388, and Mr. Moore's collection taken at Como, Que., will be published in an early number of the *Canadian Entomologist*.

The following are considered by Mr. Van Duzee of special interest:—

#### HETEROPTERA.

- Sehirus cinctus*, P. B. Como, July 24, one specimen, (Moore).  
*Banasa dimidiata*, Say. Como, Aug. 12, one specimen, (Moore).  
*Alydus eurus*, Say. Como, July 20, (Moore).  
*Protenor belfragei*, Hagl. Como, Aug. 2, two specimens, (Moore).  
*Mysius longiceps*, Stal. Como, July 25, two specimens, (Moore).  
*Ligyrocoris contractus*, Say. Como, July 26, several, (Moore).  
*Peritrechus tristis*, V. D. Victoria and Wellington, B.C., March, April and October, (Taylor).  
*Eremocoris obscurus*, V. D. Wellington, March and April, (Taylor).  
*Phlegyas abbreviatus*, Uhl. Como, July 26, several, (Moore).  
*Scolopostethus thomsoni*, Reut. Como, July 2, one specimen, (Moore).  
*Aradus abbas*, Prov. Como, July 1, one specimen, (Moore).  
*Plagiognathus politus*, Uhl. Como, July 15, (Moore); Swamp Creek, and Island Lake, Temagami District, Aug. 14 and 12, (Palmer).  
*Plagiognathus annulatus*, Uhl. Como, July 2, (Moore); Island Lake, two specimens, Aug. 12, (Palmer).  
*Hyaliodes vitripennis*, Say. Como, July 20, (Moore).  
*Pilophorus crassipes*, Stal. Como, two specimens, July 24, (Moore).  
*Phytocoris puella*, Reut. Como. Aug. 2, (Moore).  
*Phytocoris pallidicornis*, Reut. Como, July 14, (Moore).  
*Melinna modesta*, Uhl. Como, July 20, Aug. 1, (Moore).  
*Pæcilocapsus marginatus*, Reut. Como, July 8, (Moore).  
*Trigonotylus ruficornis*, Fall. Como, July 2, (Moore).  
*Mesovelis bisignata*, Uhl. Como, Aug. 1, (Moore).

#### HOMOPTERA.

- Thelia univittata*, Harr. Como, July 27, one specimen, (Moore).  
*Archasia galeata*, Fitch. Como, July 7, one specimen, (Moore).  
*Ophiderma salamandra*, Fairm. Como, Aug. 3, one specimen, (Moore).  
*Carynota marmorata*, Say. Como, July 23, (Moore).  
*Pissonatus marginatus*, V. D. Como, July 8, one specimen, (Moore).  
*Laccocera vittipennis*, V. D. Como, July 25, one specimen, (Moore).  
*Phyllodinus nervatus*, V. D. Como, July 14, one specimen, (Moore).

- Clastoptera proteus*, Fitch, var. *flava*, Ball. Como, July 24, (Moore).  
*Clastoptera proteus*, Fitch, var. *vittata*, Ball. Como, July 25, (Moore).  
*Clastoptera proteus*, Fitch, var. *nigra*, Ball. Como, July 25, (Moore).  
*Bythoscopus variabilis*, Fitch. Como, July 14, on oak, (Moore).  
*Pediopsis insignis*, V. D. Como, July 20, (Moore).  
*Oncometopia costalis*, Fab. Como, July 27, two specimens, (Moore).  
*Draculacephala manitobiana*, Ball. Swamp Creek, Temagami district, Aug. 14, (Palmer).  
*Draculacephala novaboracensis*, Fitch. Como, July 2, (Moore); Red Cedar Lake, Aug. 9, (Palmer).  
*Xestocephalus pulicarius*, V. D. Como, one specimen, Sept. 2, (Moore).  
*Paramesus vitellinus*, Fitch. Como, July 26, several, (Moore).  
*Platymetopius acutus*, Say. Como, July 20, Aug. 4, (Moore).  
*Scaphoideus auroniteus*, Prov. Como, July 30, one specimen, (Moore).  
*Athysanus plutonius*, Uhler. Como, July 2, (Moore).  
*Eutettix seminuda*, Say. Como, July 8, one specimen, (Moore).  
*Thamnotettix smithii*, V. D. Swamp Creek, Aug. 14, (Palmer).  
*Thamnotettix eburata*, V. D. Red Cedar Lake, Aug. 9, Island Lake, Aug. 12, and Swamp Creek, Aug. 14, (Palmer).  
*Thamnotettix waldana*, Ball. Swamp Creek, Aug. 14, (Palmer).  
*Jassus olitorius*, Say. Como, Aug. 12, (Moore).  
*Empoasca viridescens*, Walsh. Como, July 31, (Moore).  
*Eupteryx flavoscuta*, Gill. Como, July 15, several, (Moore).  
*Typhlocyba tricineta*, Fitch. Como, July 2, (Moore).  
*Typhlocyba bifasciata*, G. & B. Como, July 21, (Moore).

## ODONATA.

Up to the present time, although a good deal of work has been done spasmodically in working up the Dragon-flies of Canada by collectors in different parts of the Dominion, as far as I am aware, no complete Canadian list has ever been prepared. That this should be taken in hand at once, is most desirable, both on account of the important role played by these insects and also from their attractive nature. Some years ago Mr. T. J. McLaughlin worked up the species of the Ottawa district, and Dr. E. M. Walker, of Toronto, has recently made extensive studies of the Odonata of the whole Province of Ontario. Up to the end of last year he had listed 65 species, and a few others have been added during the past summer. A list of 37 British Columbian species prepared by Prof. Raymond C. Osburn, of New York, is reproduced from *Entomological News* in the September Bulletin of the British Columbia Entomological Society. As already mentioned, Mr. E. B. Williamson, of Bluffton, Ind., made a short trip into Northern Ontario during the past summer for the special purpose of collecting Odonata, and Mr. McIntosh has collected in New Brunswick.

Entomologists will be pleased to learn that Dr. E. M. Walker has undertaken a complete revision of the genus *Aeschna* in North America. He thinks that "the determinations of the species have been to a large extent guess work, and that not sufficient account has been taken of the females and of the colour markings." Dr. Walker writes: "I have already come to pretty definite conclusions as to the limits of the species, and find there are several more than has been believed by the best authorities to be the case. Females and colour pattern prove to be of great importance and individual variations within the species but slight. I am going to verify as far as possible my conclusions in the field next summer, but would like to



examine as much material as possible this winter. I shall be glad to receive any material in this genus, which will be taken great care of and returned named as soon as I have finished with it." This excellent opportunity for getting material worked up should not be neglected by collectors, and it is to be hoped that all will assist Dr. Walker to the full extent of their ability in this useful undertaking.

A small collection of Odonata collected in the Temagami district by Mr. W. J. Wilson, of the Geological Survey, in 1905, has been named by Prof. J. G. Needham, who reports as follows: "These are all more or less common throughout eastern Canada; but the specimens are of much interest, as they extend the known northward range for practically all of them." The list is as follows:—

*Gomphus sordidus*, Hagen. Kokokosing Lake, June 13, and Sturgeon River, June 29, 4 males and 8 females.

*Gomphus exilis*, Selys. Smooth Water Lake, June 22, 2 males.

*Calopteryx maculata*, Beauv. Sturgeon River, July 29, July 16.

*Hagenius brevistylus*, Selys. Kettle Falls, Sturgeon River, June 30.

*Æschna clepsydra*, Say. Kettle Falls, Sturgeon River, June 30.

Dr. Walker sends the following records:—

*Somatochlora walshii*, Scudd. DeGrassi Point. First Ontario record.

*Somatochlora williamsonii*. "I am about to describe under this name some specimens which I have had in my collection for several years, but I was not certain until recently that they were distinct from *S. elongatus*, Scudd. Mr. Williamson has taken the species in Michigan and Prof. Needham in New York. The former had recognized it as a new species and has turned his material over to me. The description will appear in the *Canadian Entomologist*. Ontario records: Toronto, DeGrassi Point, Lake Temagami." (Walker.)

*Enallagma pollutum*, Hag. Bala, Muskoka, Aug. 25, (W. J. Fraser).

*Gomphus adelphus*, Selys. Hull, P.Q., June 29, 1886, (Fletcher).

The first Canadian record.

*Gomphus brevis*, Selys. Hull, P.Q., June 29, 1886, (Fletcher); Cumberland Ont., June 16, 1900, (Gibson).

*Æschna juncea*, L. Anticosti, 1902, (Dr. Joseph Schmitt); DeGrassi Pt., Lake Simcoe, Ont., Sep. 2, (Walker).

*Basiaeschna janata*, Say. Clarke's Bush, Ottawa, May 2, 1902, (Gibson).

*Macromia illinoiensis*, Walsh. Hull, P.Q., June 29, (Fletcher).

*Helocordulia uhleri*, Selys. Buckingham, P.Q., May 31, (Fletcher).

*Tetragoneuria spinosa*, Selys. Hull, P.Q., May 22, 1886, (Fletcher).

*Leucorhinia hudsonica*, Selys. Short Bay, on Behm Canal, B.C., August 11, (J. A. Cadenhead); Anticosti, (Dr. Schmitt); Laggan, Alta., (T. E. Bean); Eastman's Springs, Ont., May 25, Hull, P.Q., June 29, (Fletcher).

*Sympetrum costiferum*, Hag. Victoria, B.C., (Fletcher).

*Sympetrum corruptum*, Hag. Banff, Alta., Sept. 13, 1897, (N. B. Sanson); Laggan, Alta., (T. E. Bean).

*Tramea lacerata*, Hag. Several fresh examples of this large southern dragonfly were seen near Grenadier Pond, Toronto, Sept. 15, 1906. I had no net, but succeeded in capturing a fine male. A few days afterwards they had all disappeared. (Walker.)

## IN THE TRACKS OF NEMATUS ERICHSONII, HARTIG.

BY REV. THOMAS W. FYLES. D.C.L., F.L.S.

It is a law of nature that no particular growth of plants should hold possession of the land in perpetuity. Sooner or later destructive agents will break in upon the scene. Insect depredators, drought, fire, storm and flood—these, and the axes of the lumbermen, make clearances for occupation by the settler, or for Nature's re-planting. In the latter case we find that the new growth is, generally speaking, different from the old. The following affords a curious exemplification of this fact:—

In 1842, when the Ashburton Treaty was made, a strip, 60 feet wide, was cut along the border, through the tamarack swamps that extend from Canada into New Hampshire and Maine. This strip is now filled up with a new growth; but the forester knows directly when he strikes the line, for he finds a belt in which the poplar (*Populus tremuloides*), the red cherry (*Prunus Pennsylvanica*), and the Moosemissie (*Pyrus Americana*), are growing, the seeds of the first having been carried by the wind into the Boundary, when newly cleared; and those of the last two, by birds.

Thirty years ago it was a fine sight to look, from an elevation, upon the vast area of swamp land, extending through Bury, Lingwick, Hampden, Ditton, and far away. Tamaracks from two feet to two and a half feet in diameter, were the lords of this forest-land. To-day, I have the authority of Mr. Ayton Cromwell and Mr. C. C. Lusk, of Cookshire, and Mr. C. H. Ward, of Bury—all experienced foresters—for stating that not a single first-growth tamarack is to be found in the whole section. And like testimony comes to me from Mr. John D. Johnson, of St. Thomas, and Mr. E. W. Brewster, of Compton, in regard to the districts with which they are respectively acquainted.

How was the destruction brought about? By an agent seemingly insignificant and wholly unexpected—a four-winged fly, belonging to the order *Hymenoptera*, and named by Hartig, *Nematus Erichsonii*.

This fly is only about eight-tenths of an inch in expanse of wings, and four-tenths in length of body. Its colour is black, but it has a broad orange-red band round the abdomen. Its wings are clear, with dark veins, and a conspicuous costal spot or *stigma*.

In the larval stage—which is the destructive stage—the species is a green caterpillar of no great size, having a black head. When it is "full-fed," it creeps into some retreat, and spins a compact, brown cocoon, about half an inch in length.

It was in the pupal stage, probably, and amongst the roots of young plants of Norway Spruce, that the species was brought to the nurseries of Massachusetts, about the year 1880.

The first notice of the arrival of the *Nematus* in Canada was given by myself, and will be found on the 17th page of the Report of the Entomological Society of Ontario for 1883. When the creatures came to us, they came in their strength—"In numbers numberless." The *Nematus* Raid, as it was called, was a phenomenon that they who witnessed are not likely to forget. That creatures seemingly so insignificant, brought unwittingly from a country so far away, should, by force of numbers, be able to strip the vast forest of tamarack of its verdure, and leave the trees in a dying state was truly marvellous.

I last saw the creatures in activity about ten years ago, in a grove of young tamarack near the old St. Henry Road, in Levis County. The trees were about twenty feet high; and here and there amongst them was a small



colony of *Nematus* larvae. The grove mentioned has lately been felled, and the land it occupied turned into a pasture.

The *Nematus* larvae had a preference for the finest growths. The smaller trees of the time were not at first so badly treated by them; and these lingered on, making brave efforts at recovery; but even these have for the most part, now succumbed. Probably the drought of 1903 gave the finishing blow to them.

Mr. E. B. Brewster tells me that half a mile from Compton Village, there is a tamarack swamp about a mile long and one-eighth of a mile wide. The largest trees in it are ten or twelve inches in diameter. Of all the trees in the swamp, probably 75 per cent. are dead, and about 15 per cent. show some signs of feeble life in tufts of sprouts from the stem. The only apparently healthy trees are on the borders of the swamp, and form a mere narrow fringe to it, one or two trees deep.

Of the dead trees in this swamp, some are only "rampikes," denuded both of branches and bark. To others the branches still cling. Here and there, among the dead trees, a few balsams (*Abies balsamea*) and cedars (*Thuja occidentalis*) are springing up.

When I visited the swamps in Bury in 1891, the rot had struck into the dead trees for two or three inches. For an account of this visit, and a calculation of the damage done by the *Nematus*, see the Report of the Entomological Society of Ontario for 1891, page 28.

When the Rutland Railway into Canada was in contemplation, dead tamarack trees lay so thickly in the swamp half way between Alburgh and Noyan, that they had to be hauled out of the way, before the survey for the line could be effected. This was in the fall and winter of 1898-9. The authority for this statement is Mr. Alanson Vosburgh, per Miss May G. Johnson of Miranda, P.Q.

In the part of Bury where I saw Maddock's gang getting out the knees for vessels in 1891, the land has been brought under cultivation.

A few notes to tell further of the kinds of trees that are springing up in place of the tamarack may be desirable.

In the Ditton Swamp, which is about three miles long and a mile broad, the tamaracks young and old are all dead. Spruce is taking their place.

In the Spalding Hill Swamp, in Eaton Township, cedar, poplar and some young tamarack are growing.

In the Harrison neighborhood in Bury Township, in parts where the soil is sandy, white birch and a few balsams are growing; on wet clay, the poplar appears.

In Long Swamp, which extends through Newport, Hampden, and over to Lingwick, spruce and balsam are growing.

To those who would see a tamarack swamp in its infancy, I would recommend a visit to "The Gomin," which lies to the west of Bergerville, about four or five miles from Quebec. In the early Summer it is all aglow with rhodora, sheep-laurel, orchids and pitcher-plants. When I first saw it in 1886, it was a broad expanse of sphagnum, unoccupied, save on its outskirts, by any larger plants than those I have mentioned. I re-visited the swamp on the 10th of July last, and found that it was dotted all over with young tamarack from a foot to fifteen feet high. On the borders of the swamp near the cultivated land there were tamaracks twenty-five feet high or more.

Doubtless, if left undisturbed, the growth on this tract will, in process of time, become a forest. And so—

"The old order changeth and giveth place to new."

## THE NOTODONTIDAE OF THE PROVINCE OF QUEBEC.

BY REV. THOMAS W. FYLES, D.C.L., F.L.S.

This interesting group of insects is not as well known as some other families of the Lepidoptera. *Datana ministra* Drury, *Nerice bidentata* Walker, *Summerista albifrons* Smith and Abbot, and *Schizura concinna* S. and A. are not uncommon with us; but other species are extremely rare; such are *Odontosia elegans* Strecker, *Dasylophia thyatiroidea* Walker, *Heterocampa pulvereana* Grote and Robinson, and *Cerura multiscripta* Riley. Of each of these kinds I have taken but one specimen in many years.

Imagos of the different species are sometimes attracted by light, and sometimes they are found at rest on palings and the bolls of trees. They are generally regarded as prizes by Entomologists.

The larvae of most of the Notodontidae are remarkable objects. Some of them assume grotesque attitudes; for instance *Datana ministra* Drury, which raises the fore and hindmost parts of its body in a threatening manner and takes the form of a bow. Some, in their early stages, are strangely horned, as is the case with *Heterocampa guttivitta* Walker in the first stage, and with *Heterocampa biundata* Walker in the first and third stages. Probably in these stages they are most in danger from ichneumons. Others again are furnished with tooth-like prominences on the back, as *Hyperaeschra stragula* Grote.



FIG. 26—Larva of *Pheosia dimidiata*. (Herrich-Schaeffer.)

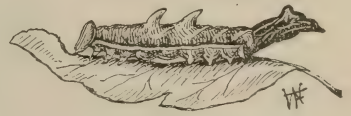


FIG. 27—Larva of *Schizura unicornis*. (Smith and Abbott.)

The handsome larva of *Pheosia dimidiata* Herrich-Schaeffer (Fig. 26) has a very rakish appearance. Its long body straight and trim, with its beak-shaped anal horn, is suggestive to me of an ancient galley, or an Algerine pirate boat—the conspicuous spiracles look like the openings for a bank of oars.

The green larva of *Nerice bidentata* Walker affords a fine instance of mimetic analogy. It feeds on the edges of a leaf; and its jagged dorsal-out-line presents a resemblance to the leaf's serrations.

The larvae of *Symmerista albifrons* Smith and Abbot, and those of *Schizura concinna* S. and A., (Fig. 27) have gouty swellings highly colored. To gardeners the larvae of *concinna* are known as "Red-humped Caterpillars." They are sometimes very injurious to young apple trees. Where apple trees are scarce, as in the neighborhood of Quebec city, they feed on the blackberry, etc. The *albifrons* larvae are often abundant upon basswood. They have the habit of hoisting the hinder parts of their bodies, and opening their claspers wide until they resemble nippers.

The larvae of *D. ministra* feed on the birch, hazel, butternut, etc. Those of *Melalopha inclusa* Hubner spin webs upon the poplars.

The four last named species are gregarious.

The caterpillars belonging to the genera *Cerura* and *Harpyia* (the moths of which are familiarly known as "Kittens") are furnished with extraor-



dinary forked and whip-like tails, which can be raised and thrown forward and agitated, as occasion requires. They are believed to be protective—their motion intimidating the ichneumons that would assail the larvae. The species have been called, on account of these tails, *Dicranuridae* (*Dikranos*, two-pointed; *oura*, a tail).

A *Dicranura* larva, when “full fed,” forms a compact cocoon, into which it works particles of the substance to which it attaches itself. Some seasons ago, at the bottom of my insect breeding-cage, there was lying a dead pupa of a hawk-moth. A larva of the kind mentioned chose to fasten itself upon this, and to work frayings from the case into its cocoon; this, in its finished state, was apparently a mere excrescence of the hawk-moth pupa.

The imagos of the Notodontidae are, generally speaking, of good size and fine appearance. The smallest of our Quebec species (as far as I know them) are: *Melanopha inclusa* Hubner, and *Gluphisia septentrionalis* Walker. The former is the “*Clostera Americana*” of Harris, and is fully described in the “Insects Injurious to Vegetation” of that author, pages 431-4. The forewings of the moth are grey, clouded with rust-red and brown. It may readily be known by the whitish V-like mark extending across the forewing. It expands an inch and a quarter. The latter species is a prettily marked one. The base of the fore-wing is brownish grey; then comes a band of pale grey, and then a central band of warm brown, bordered on either side with a dark brown line. In this band not far from the costa is a pale spot. Beyond the central band the wing is pale grey, clouded with darker grey, and having a wavy line of black dots near the hind margin. The insect expands an inch and two lines.



Fig. 28—*Datana ministra*.

*Datana ministra* Drury is a fine moth. (Fig. 28.) It varies in color from reddish ochre to brown. The hind margin, in the fore-wings, is crenated. Not far from the base of the wing is a curved cross-line; and, beyond this, are three parallel cross-lines. Running from the outer angle, for a short distance, into the wing, is a curved line. *Ministra* measures two inches in expanse of wings.

*Hyperaeschra stragula* Grote is a handsome moth. Its fore-wings are richly colored with dark grey, brown and red. Near the hind margin is a beautiful feathery line. The hind wings are white with a touch of brown at the inner angle. The insect is an inch and five lines in expanse of wings.

To my mind the Queen of Beauty among the Notodontians is the Elegant Prominent, *Odontosia elegans* Strecker. (Fig. 29.) It measures an inch and ten lines in expanse of wings. Its fore-wings are of a soft rich dove color. From the tooth on the inner margin of the wing to the base is a patch of brick-red; and at the hind margin are two parallel, scalloped, dark lines. The hind wings are white with a purplish patch on the inner angle.

The bill-hook like curve that is seen in the inner margins of the fore-wings of several of the Notodontians is conspicuous in *O. elegans*. Other species that have the curve are:—*Hyperaeschra stragula* Grote, *Notodonta*

*basitriens* Walker, *Lophodonta ferruginea* Packard, *Pheosia dimidiata* Herrich-Schaeffer, *Heterocampa biundata* Walker, *Ianassa lignicolor* Walker.

*Notodonta basitriens* Walker is another fine insect. It is an inch and ten lines in expanse of wings. Its fore-wings are brownish-grey, with a reddish brown base outlined with brown of a darker shade. It has two transverse lines, scalloped inwardly, at about two-thirds of the length of the wing. The bases of the wings of *basitriens* are suggestive of a small moth, with outspread wings, superincumbent upon the larger one, but in reverse position.

*Heterocampa pulverea* Grote and Robinson, a pretty grey moth, has somewhat of the same appearance (on a more extended scale); and so has *Macrurocampa marthesia* Cramer. The prevailing colour of the last named insect is creamy white. The base of the wing is of a warm brown outlined with darker brown. Near the centre of the wing is a distinct brown oval spot. The insect is an inch and eight lines in extent of wings. *H. pulverea* is an inch and a half.

A remarkably handsome moth is *Lophodonta ferruginea* Packard. It is two inches in expanse of wings. Its prevailing tint is a rich coffee-colour. It has white and brown scalloped lines crossing the fore-wings, and a large white patch on the costa of each of these wings.

*Pheosia dimidiata* Herrich-Schaeffer (Fig. 30) is one of the largest of our Notodontians—it is two inches and two lines in expanse of wings. It is our Canadian "Swallow Prominent." The prevailing colour of its wings is white; but in some specimens this is tinged with brown. It has an elongated dark brown patch on the lower part of the costa, broken into by a white curved line. Along the inner margin, the fore-wing is dark brown;



FIG. 29.—*Odontotia elegans*.  
(Strecker.)

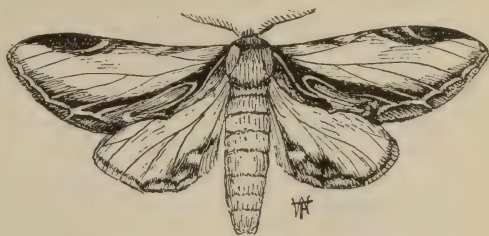


FIG. 30.—*Pheosia dimidiata*. (Herrich  
Schaeffer.)

and this colouring gradually fades and narrows along the hind margin till it ends at the outer angle. It is interrupted by white linear markings, one of which takes the form of a long oval. At the inner angle of the hind wing is a brown patch.

A fine moth of neat colouring is *Nadata gibbosa* Smith and Abbot. It is an inch and ten lines in expanse of wings. Its prevailing tint is ochreous, and it has a band of darker colour across the fore-wing, narrowing towards the inner margin. Within this band, not far from the costa, are twin white spots, small but distinct. *Gibbosa* bears a remarkable projecting crest on its thorax.

*Nerice bidentata* Walker and *Symmerista albifrons* Smith and Abbot are well known moths. In the former, the brown and grey of the fore-wings in striking contrast—the brown having two tooth-like projections—in the latter the conspicuous white border to the lower half of the costa are features that are easily recognizable.



*Dasylophia thyatiroides* Walker expands an inch and eight lines. It is of a light warm brown. The hind margin, in the fore-wings, is sharply indented. On the hind margin there is an oval spot; and on the inner margin a white lunette bordered with black. Curved lines extend from this across the wing.

*Heterocampa biundata* Walker is a handsome ample-winged moth. It is grey with an olive tint, and is marked with wavy lines. The hindmost of these presents a dotted appearance. The moth expands about two inches.

*Heterocampa manteo* Doubleday and *Heterocampa guttivitta* Walker are moths difficult to describe for general readers. Their tints are blended grey and brown and they have numerous dotted lines across the wings. The expanse of wings of *manteo* is an inch and seven lines; that of *guttivitta* is an inch and a half. *Manteo* has dark brown serrations on the hind margins of both primaries and secondaries. *Guttivitta* has a band across the primaries, feather like, with a large brown dot in each curve of the band.

*Ianassa lignicolor* Walker is an insect of trim and neat appearance. Its fore-wings are whitish grey darkened towards the hind margin. The fore-wings have a somewhat striated appearance. Across the middle of each of them is a confused brownish band, and beyond it is a second less distinct. The hind margins of these wings are crenated. The moth expands an inch and three-quarters.

*Schizura concinna* Smith and Abbot is the moth that comes from the "Red-Humped Caterpillar." It is of a rather insignificant appearance. Its fore-wings are reddish-brown, its hind wings grey, with a white border. It is an inch and five lines in expanse of wings. *Schizura semirufescens* Walker is somewhat larger than *concinna*, but in no way more attractive.

*Schizura unicornis* Smith and Abbot is easily recognized from its habit of wrapping its wings around its body, and raising itself at an angle from its support, so that it looks like a leafless twig. Its fore-wings are richly variegated with grey, brown, red and yellow, and have numerous cross-markings. The species measures an inch and four lines in expanse of wings.

The moths called the "Kittens" come next in order.

In Packard's "Forest Insects," page 566, Riley's cut of *Cerura multi-scripta* Riley is given. The insect has white fore-wings prettily marked with transverse black lines. I have one specimen taken at Cowansville long ago.

*Harpyia borealis* Boisduval is a pretty moth with pale grey fore-wings, crossed with a band of dark grey outlined with black. It has, near the hind margin, a dark grey patch extending from the costa half way across the wing. Both fore and hind wings are conspicuously dotted along the hind margins with black.

*Harpyia cinerea* Walker is a plainer insect than *borealis*. It has dark grey fore-wings and white hind wings; both bordered with black dots on the hind margins, as in the case of *borealis*.

In *Harpyia scolopendrina* Boisduval the cross band takes the outline of an hour-glass.

Usually the "kittens" are about an inch and four lines in expanse of wings. The larvae of all the species are found upon willows.

I have no doubt there are other kinds of Notodontidae to be found in Quebec Province, but I have not been so fortunate as to meet them. The study of this interesting family of insects will repay the Entomologist for his time and attention in the gratification it will afford him.

## THE LOCUST MITE.

BY T. D. JARVIS, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

During the past summer the Locust Mite (*Trombidium locustarum*, Riley) has been very common at Guelph, especially on the Red-legged Locust (*Melanoplus femur-rubrum*), but a few specimens have also been found upon the Two-striped Locust (*Melanoplus bivittatus*). The mite is most generally found attached to the base of the second pair of wings, although it is also found on the wing itself, and on any other part of the body where it cannot be readily detached by the locust; a favourite position upon the body is between the segments of the thorax and abdomen, and also behind the upper joints of the legs; in such positions their only means of attachment to their host is apparently by their mandibles.

The young mites are nearly spherical, and look very much like the eggs of insects (Fig. 32, *b*). The mite sucks the blood of its host until it reaches maturity, during which time it often becomes so swollen with food that its legs are rendered very inconspicuous (Fig. 31, *a*). As many as five of these young larvae have been found upon a single locust.

The adult mite is of a bright crimson color and about one-eighth of an inch long (Fig. 31, *c*, *d*). When full-grown it passes to the ground, where it remains over winter. Dr. Riley, who has studied the life-history of this mite, states that the eggs are laid an inch or so under the ground in clusters containing between 200 and 400. Early in the spring from these eggs emerge the young mites, which, upon reaching the surface of the ground, attach themselves to their hosts. These little mites render good service in checking the spread of the locusts, as almost every locust upon which one is found appears to be more feeble and sickly than those which have not been attacked.

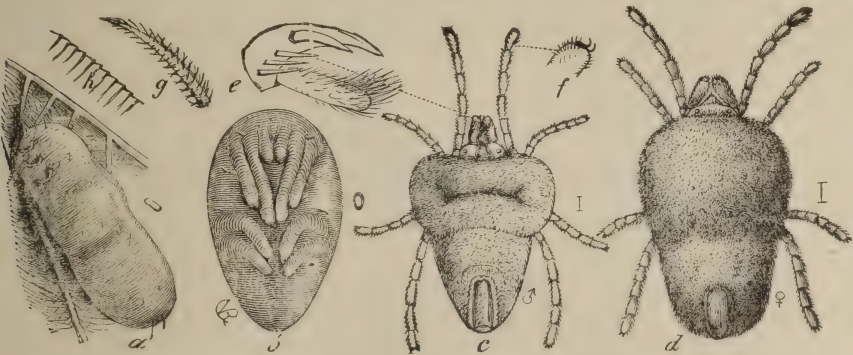


FIG. 31.—*TROMBIDIUM LOCUSTARUM*—(a) mature larva when about to leave the wing of a locust; (b) pupa; (c) male adult fresh from the pupa; (d) female—the natural sizes are indicated by the short lines on the right (e) palpal claw and thumb (f) pedal claws; (g) barbed hair; (h) the striations on larval skin (after Riley.)

## THE OYSTER-SHELL BARK LOUSE.

BY T. D. JARVIS, ONTARIO AGRICULTURAL COLLEGE, GUELPH.

The purpose of this article is to place before the fruit-growers and all interested in practical entomology, the main facts regarding the life-history, habits and appearance of the Oyster-shell Bark Louse Scale, and of the scales which are often mistaken for it. The damage done by this scale of late



years has attracted so much attention, and so many enquiries have been received concerning the best methods for its eradication, that it is hoped earnest efforts will be made at once by all concerned to get it under control.

The Oyster-shell Bark-louse (*Mytilaspis pomorum* or *Lepidosaphes ulmi* Linn, as it is now called) is widely scattered throughout the orchards of Ontario, and the damage done by it is very considerable over the Province and rapidly on the increase.

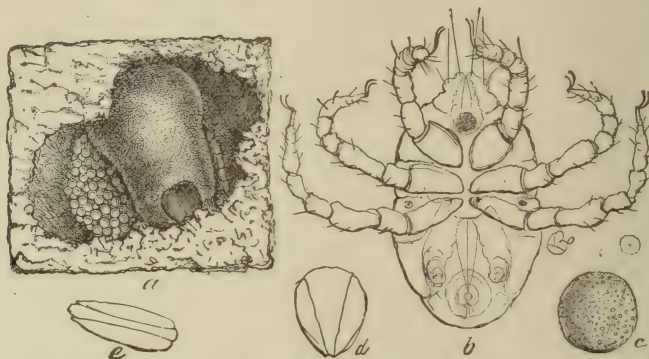


FIG. 32.—*TROMBIDIUM LOCUSTARUM*—(a) female with her hatch of eggs: (b) newly-hatched larva—natural size shown by the dot in a circle on the right; (c) egg; (d, e) empty eggs-shells (after Riley.)

Although of European origin, it has been known in America for more than a century, and has gradually spread throughout the larger portion of North America.

This scale is a very serious pest in orchards which are neglected and badly treated, but experience has shown that with careful treatment it can be readily kept in check. It has been found to occur on the following trees and shrubs: Apple, plum, pear, wild red cherry, grape, currant, rose, maple, poplar, ash, birch, and various others.

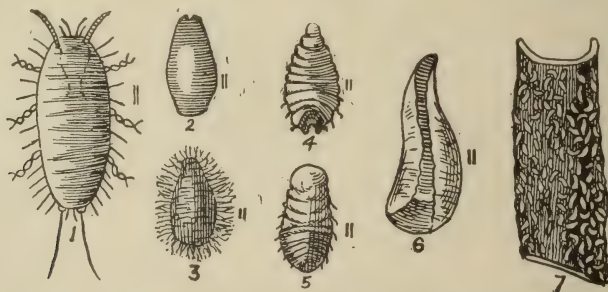


FIG. 33.—The Oyster-shell Bark-louse.

In order to combat this scale, it is first absolutely necessary that one should be well acquainted with its life-history.

*Life-history.*—This minute insect, found upon the bark of the small twigs and also upon the branches and trunks of the above-mentioned trees, is readily identified by its oyster-shell-shaped scale, about one-sixth of an inch in length. It is of a brown colour, and, thus disguised by the bark, is not seen unless by close observation. Usually a good many are clustered together, and their shape is so marked that orchardmen should soon recog-

nize them. These scales sometimes cover twigs and large branches completely; even the leaves are often infested, and sometimes the fruit itself becomes more or less covered. Last year the fruit on several Maiden's Blush apple trees grown in the orchard of the O. A. C. was noticed to be affected by the scale. This, however, is the exception rather than the rule.

The insect is one-brooded, and winters over in the egg stage. The eggs can be easily seen if at any time in the fall or winter the old scales be lifted up and examined beneath. Numbers of very small whitish-yellow eggs will be seen. Here beneath this oyster-shaped scale they remain until early in the summer. The young yellow lice escape from the eggs during the last week in May and the first week in June; that is, in the vicinity of Guelph. They

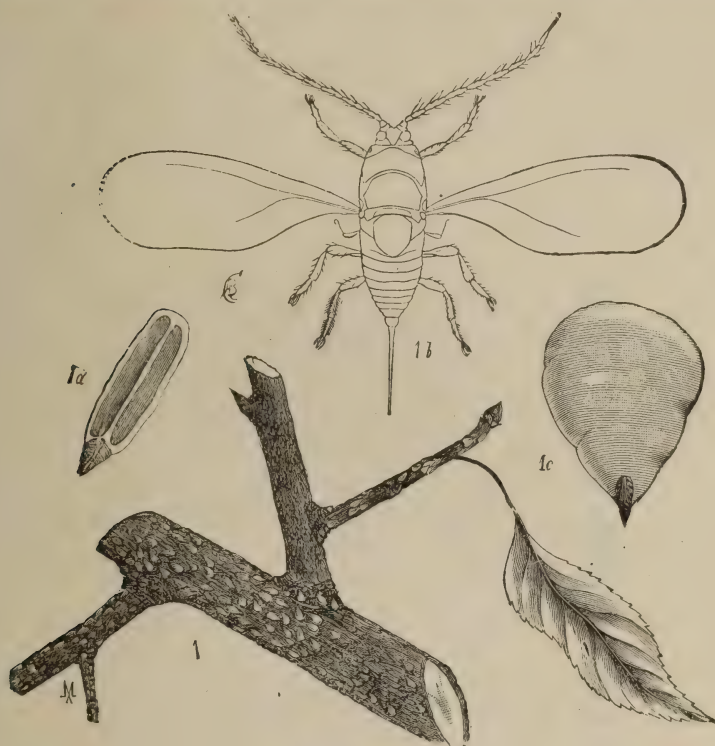


FIG. 34—The Scurfy Bark-louse.

wander for a few hours, or a few days, on the limb, then settle down and secrete a scale. They fix themselves upon the tender bark, which they pierce with the beak-like structures connected with their mouths, and by means of which they are able to suck the sap from the tree. The larvae moult, or shed their skins, twice in the course of their growth during the summer. These moults can be readily seen on the narrow end of the large scale. The adult female dies soon after the laying of the eggs, about 60 in number, in the fall. They may be spread from tree to tree to some extent by birds, and also by other insects.

Such is the life-history of the Oyster-shell Bark-louse, and before entering into a discussion as to the best means to adopt for its eradication, it will be as well to briefly mention and describe one or two other species of the commonly-occurring scales which most closely resemble it, and to point out the differences for this purpose cuts are given with the various scales.



*The Scurfy Bark Louse (Chionaspis furfurus).*—The Scurfy Bark-louse is not so widely distributed through Ontario as the Oyster-shell Bark-louse, and does less damage. It occurs most commonly on pear, apple, gooseberry, and black currant. This scale resembles the Oyster-shell Bark-louse closely in shape and size, the main points in which they differ being in the colour of the eggs and in the adult scale.

The eggs of the Scurfy Bark-louse are of a purplish colour, whilst those of the Oyster-shell are a whitish-yellow. The adult scale of the Scurfy Scale is also white in colour. The female scale is much larger and more oval than the male scale.

The same remedies may be employed against the Scurfy Bark-louse as are advised in this article as being most suitable for the Oyster-shell Bark-louse.

*San Jose Scale (Aspidiotus perniciosus).*—The San Jose Scale is readily distinguished by the characteristic shape of the female scales. They are round and nearly white, with generally a clearly-defined central nipple. After the first moult the scales become almost black, with a conspicuous depressed ring around the nipple. The adult male scale is oblong in outline, with the nipple near one end, and is much smaller than the female.

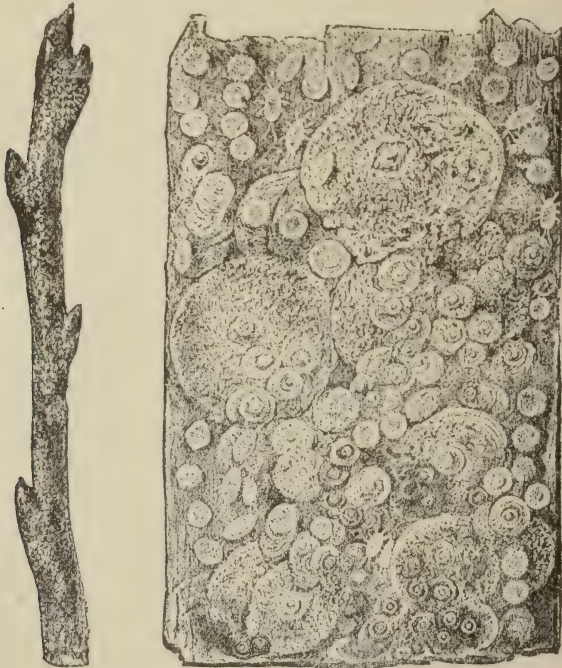


FIG. 35.—San Jose Scale.

The following points will clearly separate the San Jose Scale from the Oyster-shell Bark-louse and the Scurfy Scale:

First: The arrangement or grouping of San Jose Scales on the bark is generally characteristic, and is often sufficient to at once identify them.

They seldom have a tendency to cluster, if there be few in number, but, instead, are scattered somewhat evenly on the bark.

On badly-infested trees the presence of the scale on new growths and the fruit produces a deep-red coloration on the tissues of the bark.

It leaves no conspicuous, ventral, whitish scale on the bark after the removal of the insect, as does the Scurfy Bark-louse.

The reason for considerably more damage being done by the San Jose Scale than by the Oyster-shell Bark-louse is on account of the San Jose Scale producing many broods in one season, and also bringing forth its young alive, whereas the Oyster-shell Bark-louse is one-brooded and winters over in the egg stage.

The treatment to be adopted for nearly all the scales is practically the same in all cases. On deciduous trees, where the scales remain during the winter upon trunks and branches, and where the trees become dormant, the scales are best treated during the winter. At that time there is no foliage to interfere, and much stronger washes can be used than would be possible during the summer, or when the tree is active. It is extremely difficult to penetrate insect tissues with ordinary liquids, and it has been found impossible in practice to obtain good results in the destruction of scale insects, except by means of caustics. The common soaps are all caustic, and, when applied in strong solutions, the scale is shrivelled, lifted, and partially corroded, so that the oily mixture works its way beneath into absolute contact with the insect. Or it is raised at the edges and washed off by the rains, carrying with it either eggs or young, as the case may be. In fact, where the eggs hibernate, winter applications act only by exposing them, so that they are easily washed away by rains and scattered.

In the case of plants which do not lose their foliage at any period, or in conservatories, or where winter treatment for any reason is not feasible, we must attack the insects when the larvae are crawling about, and before they are fixed. At that time, whilst not protected by a scale, they may be easily killed, almost any of the contact insecticides being effective.

*Remedies.*—Owing to the large number of applicants who were desirous of obtaining information on the best methods of combating the Oyster-shell Bark-louse, it was decided to carry on a number of experiments here, to test the efficiency of the various insecticides commonly used against scale insects.

Of all the spray mixtures tried, the well-known lime, salt and sulphur wash gave the best results.

The lime, sulphur and caustic soda, and the lime, sulphur and sal soda were also tried, but without quite such good results. The lime, sulphur and caustic soda proved to be a little superior to the lime, sulphur and sal soda, owing to its apparent power of better penetration.

*Soaps.*—Various soaps were also tried, and of these the Whale-oil Soap Emulsion gave the best results, many of the scales being killed.

The Whale-oil Soap gave good results also, but not equal to the Emulsion.

Sunlight and Lifebuoy soaps, and also a mixture of both, proved to be of very little value, inasmuch as they did not prevent the eggs from hatching. These soaps are claimed by the makers to be most effective against the San Jose and other scale insects, but applied as a winter wash against the Bark-louse they have little value. Undoubtedly they should be applied after the young lice hatch, and not as a winter application, and then would most likely prove effective against the tender lice.



*Kerosene Emulsion.*—Kerosene Emulsion was also tried, and this proved of more value than the Whale-oil Soap Emulsion, but not so effective as the lime, salt and sulphur wash.

*Lime.* Quick slaked lime,  $1\frac{1}{2}$  lbs. to 1 gallon of water, proved very effective applied as a winter wash, and equalled the results obtained by the lime, salt and sulphur.

*Kerosene-Lime.*—This was also tried, but did not prove superior to the Kerosene Emulsion, and therefore is not to be preferred to it.

The lime-sulphur sprays must not be applied while the trees are in foliage, first, because of the disastrous results that follow when this is done before the leaves have matured; and secondly, because of the difficulty in making a thorough treatment at such a time. The month of March and the early part of April, before the buds commence to open, is a good time to spray with these mixtures.

### THE BEAN WEEVIL (*Bruchus obtectus*, Say).

By ARTHUR GIBSON, ASSISTANT ENTOMOLOGIST, CENTRAL EXPERIMENTAL FARM, OTTAWA.

An insect which, fortunately, has only been reported on a few occasions as doing damage in Canada, is the Bean Weevil, *Bruchus obtectus*, Say. Authentic instances of injury by this insect have been received from one locality in Ontario, and from two in Quebec. The injury in all cases was to seed beans.

The Bean Weevil (Fig. 36) is a small, hard-shelled beetle, one-tenth of an inch long, oval in form, with the head bent down and more or less concealed, as seen from above, and prolonged into a squarely-cut snout, or beak. Its antennae are distinctly jointed and enlarged at the tip, the first four joints and the last one reddish. The wing-covers are marked with ten impressed and dotted longitudinal lines, and the whole body is covered with long, silky hairs. The lines on the wing covers are broken up into pale yel-



FIG. 36.—The Bean Weevil.

lowish dashes and dark brown spots. The tip of the abdomen extends beyond the wing-covers, and is of the same reddish tinge as the tips of the antennae and the legs, but is covered more or less with short, silky hairs, and bears a central white line, but there is no appearance of the two black spots so conspicuous in the Pea Weevil, which it resembles in shape and movements. Compared more closely with this latter well-known insect, the Bean Weevil is not one-half so large, is more soberly colored, having less white on the wing-covers, and lacks the white spot on the middle of the

hinder part of the thorax, and the two black spots mentioned above, which are present on the exposed tip of the abdomen of the Pea Weevil.

"The life-history of the Bean Weevil differs in some important points from that of the Pea Weevil. The eggs of both are laid upon the pods while these are young and tender. On hatching, the young grub of the Bean Weevil eats its way inside and penetrates one of the forming beans, several grubs entering a single bean, each one forming for itself a distinct cell. They become full-grown, and change to pupae in the autumn, and a little later to the perfect beetles. The date of emergence from the seed depends very much, as in the case of the Pea Weevil, on the temperature in the autumn months; it may be in the late autumn or not until next spring; when the seed beans are stored in a warm building, the beetles may emerge at any time through the winter. One of the important differences between the life-histories of the Pea and Bean Weevils is that, whereas in the case of the former the young grubs can only enter the soft green seeds, those of the Bean Weevil can propagate for three or four generations in the dry stored seeds. This fact renders the well-known domestic remedy for the Pea Weevil, of holding the seed over for two years, quite ineffective in the case of the Bean Weevil; that is, if the bag of peas infested with the Pea Weevil were put away for two years, the Pea Weevils would emerge the first spring and die in the bags. But in the case of a bag of beans infested by the Bean Weevil kept in the same way, the beetles on emerging would at once set to work to lay eggs on the beans. The young grubs when hatched would penetrate the dry seeds and go through all their stages, and this breeding might be repeated as long as the supply of beans lasted. Curiously enough, the Pea Weevil does not bore holes through the paper or cotton bags in which infested seed has been stored, but in the case of the Bean Weevil, such bags are readily perforated and the beetles escape,—frequently when this happens in houses, as is sometimes the case, to the great consternation of the inhabitants." (Fletcher, Bull. 52, Cent. Exp. Farm, Ottawa.)

In the United States the Bean Weevil has been known for a great many years. It was found injuring beans in America in 1860, near Providence, Rhode Island. Since then it has become wide-spread in distribution in that country, and has done a considerable amount of damage. At first it was considered to be a native species, but it is now thought that the original home of the insect was in Asia, and that it was introduced into America through commerce. The first record of injury done by the Bean Weevil in Canada was in 1898, in Middlesex County, Ontario, and since then two further instances of loss from the ravages of this insect have been reported from Quebec Province. Quite recently the writer heard of the presence of the Bean Weevil at Guelph, Ont., in beans imported for seed from the United States. (It has also been reported from Aurora, Ont.—C.J.S.B.)

The Bean Weevil shown herewith is only about half the size of the Pea Weevil, but resembles it in general appearance. The best remedy for both of these insects is bisulphide of carbon. The most convenient way to fumigate is to place the seed in an ordinary coal-oil barrel, and pour on it one ounce of the bisulphide of carbon for every 100 lbs. of grain, then close the barrel tightly, first with a wet canvas or cloth, and on the top of this boards, which should be left undisturbed for at least two days.



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 McEvoy, Mrs. Wm., Woodburn.  
 McEvoy, Wm. John, Woodburn.  
 McEvoy, John, Woodburn.  
 McGillivray, John, Oak Bridges.  
 McTavish, A. C., Carleton Place.  
 McGregor, Alpine, Inglewood.  
 McCrimmon, D. F., Dunvegan.  
 Nolan, Denis, Newton Robinson.  
 Newton, John, Thamesford.  
 Noble, A. H., Creswell.  
 Pierce, Moses, Brimsley.  
 Patterson, R. L., Lynden.  
 Pierie, John, Drumquin.  
 Pettit, Morley, Aberfoyle.  
 Pickett, A., Kilbride.  
 Rowsome, H. R., Burlington.  
 Robinson, Sydney, Vasey.  
 Robinson, Edward F., Victoria, B. C.  
 Robert, H. T., McIntyre.  
 Reaman, Josiah, Carrville.  
 Switzer, J. F., Orangeville.  
 Sparling, J. W., Bowmanville.  
 Smart, N. J., Collingwood.  
 Storer, Jas., Lindsay.  
 Saunders, Geo. E., Hornby.  
 Shaver, Jas. H., Cainsville.  
 Scott, Mrs. Nottawa.  
 Sibbald, H. G., Claude.  
 Smith, N. S., Tilbury.  
 Smith, R. H., St Thomas.  
 Scheilz, Mathias, Renton.  
 St. John, Wm., St. Raphael.  
 Smith, David, Thedford.  
 Trick, John, Port Hope.  
 Taylor, Alex., Paris.  
 Taylor, Mrs. Alex., Paris.  
 Tattersall, D. H., Grandview.  
 Thompson, James, Britannia.  
 Timbers, John, Cherrywood.  
 Trinder, Edwin, Simcoe.  
 Treverrow, Miss M. B., Meadowvale.  
 Thomas, Joshua, Arthur.  
 Whitside, R. F., Little Britain.  
 Walterhouse, J. H., Toronto.  
 Wood, George, Wesley.  
 Wood, Samuel, Nottawa.  
 Wilson, W. L., Elmvale.  
 Wheeler, Lawrence, Brussels.  
 Walton, W. S., Scarborough Jct.  
 Walsh, Austin M., Young's Point.  
 White, F. E., Inverary.  
 Webster, Thos. J., Oakwood.

# Ontario Beekeepers' Association.

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## ANNUAL MEETING.

The twenty-seventh Annual Convention of the Ontario Bee-Keepers' Association, was held in the County Council Chamber, Toronto, on the 7th, 8th, and 9th of November, 1906.

The President, Mr. H. G. SIBBALD, Claude, Ont., occupied the chair at all the meetings in a very acceptable manner. The meetings were largely attended and the greatest of interest was manifested throughout.

The Hon. NELSON MONTEITH, Minister of Agriculture, attended one of the sessions, and took part in the discussion.

The president took the chair, and called the meeting to order, after which the minutes of the last meeting were read and adopted.

Mr. R. H. SMITH: I would like to ask whether the Department took up that matter of the adulteration of honey in Ontario, or if steps were taken to vindicate the character of the bee-keepers in Ontario?

The SECRETARY: I have the following letter from Ottawa:

OTTAWA, Nov. 5, 1906.

DEAR SIR,—In reply to your letter of the 2nd instant to the Minister, any correspondence received by this Department in regard to adulterated honey has been transferred to the Department of Inland Revenue, to which I am transferring your letter just received.

Yours truly,

GEO. L. O'HALLORAN,  
Deputy Minister of Agriculture.

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## PRESIDENT'S ADDRESS.

By H. G. SIBBALD, CLAUDE.

It is my pleasure to again greet you, to bid you another welcome to the annual meeting of the Ontario Bee-keepers' Association, which is, I believe, the twenty-seventh meeting of this association.

I regret that I cannot congratulate you on having had an abundant yield at this our harvest home meeting. Still some words of cheer ought to be said, and I can truthfully and confidently assure you that we are one year nearer a great big crop than we were at this time last year. The price of honey has advanced to nearly where it always ought to stay. Honey is a cheap and most wholesome food at 12½ to 15 cents per pound, and at those prices will compare most favorably with other foods, and as a healthy pure food for mankind it cannot be excelled.

There is no reason why prices as at present should not be maintained. This is Canada's growing time. Thousands are pouring into our country. Cities, towns, and villages are growing at a tremendous rate, and it is up to us to supply the people with the best food—honey.

Bee-keeping in the past has been marked by progress. No industry has made more rapid strides, and still we are going ahead. Appliances, devices, methods are being adapted and used to enable the bee-keeper to keep more bees, produce more honey, and live comfortably and with the dignity becoming our most interesting occupation.



Our Association should have much credit for this advancement, having secured laws that have saved the industry from destruction. Along this line will come before you an announcement intimating that our grant for the suppression of Foul Brood is to be doubled, showing also that a deep interest is being taken in our industry and this association by the Hon. Nelson Monteith.

There are some other things I would like to say. The Foul Brood Act, as some of you are aware, has been changed, taking away from the Association the right to appoint and the right to direct the inspector. That is now in the hands of the Department of Agriculture. This was not done in an arbitrary way at all. The committee consisting of Mr. Couse, Mr. Gemmell, Mr. Miller, Mr. Hall, and myself were invited to interview the Minister, and we all said it would be better if such a step were taken. The inconsistency of the old plan was shown up very plainly, that is, the President had the directing of the Inspector and the Department had the paying. The Department thought it either ought to be both done by the Association or both done by the Department, and we thought that as the President changes from year to year it would be better if the Department were to take it over. The amendments, as recommended by our Association last year, were taken into consideration, and the new Act was based, I think, on this recommendation. They are not just as we sent them in; perhaps they are better. We will find that out in the working of the new Act.

In regard to the Horticultural Exhibition, I may say they are doing a lot of hard work on that exhibition, and our Association is co-operating with them. It was my duty to come to Toronto together with other directors and the President, and the Mayor of the city, and we met the Eastern Passenger Association. The outcome of that meeting was that we obtained single fare rate for a full week, and two days in which you can come from any part of the Province to Toronto at half fare. It was by means of this Association co-operating with other Associations that we were able to get that advantage.

Mr. J. D. EVANS, Islington: As a member of the Municipal Council, and having been associated with them for twenty-seven years, I am charged by the Warden to welcome this Association to our building. We are glad to have you this year, and we hope that for many years in the future the bee-keepers will meet in our old historical hall.

The CHAIRMAN: I am sure we are all grateful to the County of York for placing this hall at our disposal.

R. H. SMITH, St. Thomas: Our President has said that this was the twenty-seventh annual meeting of the Ontario Bee-keepers' Association. I was one of the members present at the first meeting held in the city hall. We have made advance in many ways, but not as many advances as I would like to see. Bee-keeping, as I found it when I joined the Association, has not advanced as far as it should, particularly among the farmers. We find first-class honey put on the market in a very crude state by the farmers, and it is a very short sighted policy on their part. If they would only take more interest in bee-keeping, and join the local Association, they could be very much enlightened, not only for their own benefit but for the benefit of bee-keeping generally. Your directors have been trying to follow the suggestions that Mr. Pettit gave in his paper last year, of how to make the Ontario Association more useful, and many other things were suggested; among others, that the local Association might be much more extended or made more useful by making them members of the Ontario Association, if they wished, by paying a little extra fee. A similar line to

this is done in the National Association in the United States. We hope in that way to create a greater interest.

I am sorry to say that we cannot congratulate ourselves on having a large crop of honey this year. In fact I believe it is one of the lightest crops we have had for ten years. I do not remember a time when we have had such a light crop all over the province. I have known partial failures in other years when there has been a light crop in the west, and a better one in the east, but this year it seems to be generally light all over. The honey on exhibition is particularly fine for this season. I do not remember ever seeing any better, and the prospects are that we will realize higher prices. There is no reason why the prices should be lower in the near future. Other agricultural products have advanced, and honey is just as valuable as any of them. We have a growing market; it was thought at one time we would need to cultivate British markets, but we have a market right at home that we cannot supply.

Mr. HOLTERMANN: There is just one point that Mr. Smith spoke of that has impressed me, that was in connection with the prices of honey. I do not think it is a desirable thing for honey to be the price it is at the present time, from year to year. If we had a larger crop we could afford to sell for a great deal less money. For years everything we have required for a living and for supplies and so on has increased in value, but honey has remained at just about the same price. I think that it is within the power of the bee-keepers to raise the price of honey higher than it has been for the last two or three years. If the quality is good, people will be willing to buy it.

Mr. BROWN: I find the people in Toronto are willing to give a good price for a good article if it is put up in a proper manner.

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### THE HONEY EXCHANGE.

The CHAIRMAN: One man wrote to the Committee, and said he got a half cent more than he did the year before, and another man wrote and said he would have been willing to sell his honey for 8 cents if it had not been for the committee's advice, and he sold it for 10 cents. The committee regret that they cannot have more reports. It would help on the work wonderfully if every bee-keeper would send in reports. That committee work is costing me something. I was in a store the other day that I have been selling to for two years. They said they were right out of honey, but as the proprietor was not in, I had better phone him about five o'clock, when they were sure I would get an order. When I phoned he said, "Are not you a sort of trust or something in that Association of yours? Aren't you the President of the committee that controls the price of honey?" I explained to him how it was, and he said, "A farmer came in here and sold me one thousand pounds of honey for eight and a half cents a pound, and then he got a letter from your committee saying it was worth ten cents, and he would not give me the honey." Then he said, "I will have you down in the Police Court and have an investigation and break the trust." I told him I was sorry about that, and I did not think we had done anything wrong, but I lost a customer; however, I can sell all the honey I have got.

Mr. TIMBERS: Is it necessary to send the honey out of the country? If we get an off year like this, we will not have enough. I have refused mail orders for over 2,000 lbs. that I cannot supply.



Mr. McEvoy: Next year we may get a good crop, and you would not like to sell it at six and a half or six.

Mr. TIMBERS: It is not necessary.

Mr. McEvoy: If we can ship a lot off it will be all the better for you.

Mr. EVANS: It seems to me the lesson of a good crop is that when there is a low crop the bee-keeper should keep his honey and pack it away. Honey keeps from year to year, and every four or five years there is a failure, and that year absorbs all the surplus stock.

Mr. R. H. SMITH: I had a little experience trying to get members to join the Honey Exchange. A bee-keeper living west of us produces about 150 lbs., and I asked if he would not join the Honey Exchange, and he said "No, my father belongs to the church," and would not think of anything of the kind.

Mr. HOLTERMANN: I saw a letter this year written by a Government official, who stated that they wanted honey for a certain exhibition which was going to be held, and he stated that he understood that dealers had bought up the crop and were forcing the price up, and that the honey had to be got, and to pay whatever price was to be paid. Another gentleman of a long business experience, said to me, "Is not this a combine; you had better be very careful." I told him that it was not a combine.

The CHAIRMAN: We do not attempt to control prices. We simply advise our members what we think our honey is worth, and if they want to sell it at less than that price, they can do so.

Mr. NEWTON, Thamesford: This has been great help to bee-keepers. I know several that have held their crop after they got the report. I do not think the people in general look upon it as a trust. I know it will have a tendency to keep up the price. A man who is shipping out, always calculates that he is making enough out of the shipment to pay him the difference in the freight rates. It has paid me to ship out to the west, and I am perfectly willing to pay freight rates. I think the funds of the Association have been used in the best interests of the bee-keepers of Ontario.

Mr. HOLMES: There has certainly been good and helpful work done for the bee-keepers of this Province in getting out their report. It has always been my wish that this report should be issued as a private bulletin, to bee-keepers only, and if at all possible, it should not find its way into public print. I therefore think that we should exercise the greatest care to have our honey A1 quality, and the fact that it is A1 should be kept to the front always. If we get any inferior honey, we should not sell it to inexperienced people, who do not know good honey; we should put inferior honey up in barrels and sell it to manufacturers.

Mr. DEADMAN, Brussels: I think it is intended for the bee-keepers only. I have found that it makes it more difficult to buy honey. Last year I bought honey cheaper in winter time than I could in the fall. It would be well for the committee to act with caution, because, if the price is too high, the bee-keeper holds it, and then if he finds that he cannot get the price, he will not be satisfied.

Mr. NEWTON: I am not in favor of keeping the price to bee-keepers in general. I was very much taken up with the article that appeared in the *Globe* after the report of the Exchange. Several of the business men speaking to me, seemed to be ready to buy and to take in the situation at once. They thought there was not much honey in the market, and they were willing to take the honey at the bee-keepers' price.

Mr. COUSE, Streetsville: The longer I have been on the committee the more confidence I have in it. The price set by that committee may be a

cent or half a cent each way, but the committee are probably straight in nearly every case. Mr. Newton has just spoken with reference to the report in the papers. Mr. Craig and myself both went to the papers. We said, we are here for no purpose but what is right. We showed them the reports we got from all over the Province, and said that we did not want to hide that from anybody, we wanted to give it to the people. We gave it to the *Globe*, and the *Mail and Empire*, and that report went out, and it was fairly correct, and the bee-keepers have received the price that the committee suggested. We do not bind anybody to keep their honey; we felt that this price ought to be obtained. This is not a combine, but it is a proper thing to do. A seed firm in Chicago has a man who goes all over the country to get crop returns, and we have a perfect right to do the same kind of thing. When we get a report from the bee-men, we know fairly well the kind of honey that is in the Province. I think the work of the committee has been very beneficial all the way through. (Hear, hear.) We do not pretend to be perfect.

Mr. McEVoy: The price is partly fixed by the outside world. They can lay down honey from Jamaica for  $7\frac{1}{2}$ c.

Mr. COUSE: Buckwheat honey is better than that.

Mr. HOLTERMANN: Mr. McEvoy is perfectly right. You will get log-wood honey for that price, but I am not afraid of it in competition with our Canadian honey at considerably less than the Canadian price.

Mrs. SCOTT: I was going to suggest that this Jamaica honey was not worth more than 6c., and if you buy it at  $7\frac{1}{2}$ , it does not affect our good honey. Honey sells upon its merits. I think we should send this report to bee-keepers outside our Association. These are the men that generally break the market down.

Mr. GROSJEAN: The demand generally rules the price. The honey exchange is not doing any more than trying to find what the produce of the country is, and they are only giving advice to bee-keepers and they suggest what the price should be, and this is not more than what the Government does. I have been giving them a monthly report on fruit. Apple buyers combine together, and find out what the prospects of the apple crop are when they are the size of peas, and they set a price later on. I am very proud of what the Honey Exchange has been in the past, and I hope they will follow it up and get in the smaller bee-keepers who do not belong to the Ontario Association. I have great pleasure in moving a vote of thanks to the Honey Exchange for the good they have done in the past, and hope they will continue in the future.

Mr. CHRYSLER: I second that motion.

Mr. KIRBY: I find that the greatest draw-back in my part of the country, are the farmers. When they get any honey, they run into town and dispose of it at a low price, and I think it would be well if we could find some means of reaching these people.

Mr. HOLTERMANN: There is only the one way that can be done and that is by greater activity in the local organization.

The CHAIRMAN: I may say our object in putting it in the paper was so that it would reach the small bee-keeper. We have upwards of 200 members in this Association, and there are three or four thousand bee-keepers in the Province. So far as I am concerned, I think it was all right to have it in the paper.

The motion was put to the meeting, and carried.

Mr. G. A. DEADMAN: I think the wholesale and retail price should be kept confidential to the bee-keepers, but let it be scattered broadcast that there is a scarcity of honey. There is one thing I do commend the com-



mittee for, and that is in fixing the price. Too many bee-keepers make no difference between the men buying wholesale and retail. Wholesalers of Toronto and Hamilton buy honey to sell to the grocerymen, and they have to get it at less price than the consumer.

**THE CHAIRMAN:** We are glad the members of the Association approve of the work of the committee generally.

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## THE PRODUCTION OF COMB HONEY.

BY U. H. BOWEN, NIAGARA FALLS.

In the absence of Mr. Bowen, his paper was read by Mr. Pettit.

The essential requisites for the production of comb honey are a good honey flow, strong colonies of bees, convenient hives, and an apiarist who understands handling the bees and hives so as to take advantage of the flow of nectar.

The first of these requisites is beyond our control, except that we should take care to locate our apiaries where there is usually an abundance of nectar-secreting plants and trees, such as clover, basswood, etc. In my location clover is the only source of surplus honey.

The strength of the colony of bees depends largely upon the care it gets after being taken from its winter quarters. A colony that has wintered well, and has a good queen and an ample supply of food, will usually be in good condition for the harvest when it comes.

The hive should be sufficiently large to contain a good supply of honey and yet leave room for all the brood a good queen can produce. It should be easily enlarged or contracted as the occasion may require. The hive I use holds eight Langstroth frames in the brood chamber, which is large enough for the greater part of the year. In the spring, when a colony is building up rapidly and needs more room, I enlarge the hive by adding a half-story super containing eight frames, five inches in depth, being equal to five Langstroth frames, thus increasing the capacity of the brood chamber to thirteen frames.

When the harvest is at hand and the hive overflowing with bees, put on a super of sections. If the colony is in a one-and-a-half story hive, remove the half-story, making sure that the queen is in the lower brood chamber, and put on a queen excluder to keep her there. Put on the sections, and on top of them the half-story super that was on the hive in the first place. The entrance should be the full width of the hive, and about an inch wide during the harvest. After the bees are nicely started in the sections, the super of shallow frames may be taken away and another super of sections put on in its place.

About this time the colony will be preparing to swarm. The swarming impulse is not the great misfortune that it is often represented to be. The choicest comb honey is usually produced by the colonies that have swarmed either naturally or otherwise. But the swarming must be controlled, and I know of no better plan than the "shook" swarming. Shake the bees into a new hive containing five frames filled with wired foundation or starters, as you prefer (my preference is the wired foundation), and one frame of comb to catch the pollen. If that frame of comb contains a quantity of unsealed brood no harm will be done. Put in enough dummies to

fill out the hive. Set the new hive on the old stand with an empty hive body below the brood chamber. This empty body will give the bees room to cluster in, and they are not likely to swarm out next day as they probably would do without it. It should be removed after the second or third day. In shaking the bees I prefer to shake all the bees and give the brood to some other colony to take care of. The sections should be taken from the old hive and placed on the new one.

Where shall we put the sections that we add to a hive that has one or more supers on? And how many supers should we have on a hive at one time? I have no fixed rule for putting on sections. It is largely a matter of judgment, for what is all right in one case may be all wrong in another. I usually put the second super on top of the first, leaving it there till I think it is safe to put it below without danger of the bees stopping work in the first one. The third super is put on top with No. 1 next and No. 2 below No. 1, and so on, crowding, if anything, the lower supers, and keeping an empty one on top in reserve. It is there if needed and if not needed it does no harm.

The sections and foundation we use are two important items in the production of comb honey. The plain or no-beeway section with the fence separator is much superior to the old style beeway section and plain wood or tin separator. I have given both kinds a thorough trial, and am decidedly in favor of the no-beeway section. The sections should be so placed in the super that there will be a fence separator between the outside rows of sections and the sides of the super, leaving a passage-way for the bees on each side, which results in the outside rows of sections being nearly, if not quite, as well filled as the middle ones, and in about the same time—sometimes sooner. I have taken off supers of sections where the only unfinished sections were in the centre rows. Use full sized sheets of extra thin foundation in the sections. The thinnest foundation is the best and most economical to use. A section that is higher than it is wide is better than a square one. The high sections sell more readily and are preferred by dealers.

When removing the filled supers of honey from the hives, bee escapes are very convenient; but it is not necessary to have an escape board for each hive. A few puffs of smoke will drive most of the bees out of the super to be taken off, and then it should be quickly removed. Pile the supers up at the side of the apiary with an escape board underneath, and in a few hours they will be free from bees. The honey should be stored in a warm, dry place if possible. I use the cellar under my house for storing the honey, and keep it dry with a small stove burning natural gas, which is lighted more or less every day while the honey is there. If there is no unsealed pollen in the combs it will not be necessary to fumigate comb honey.

The Italian bees have not given as good satisfaction in comb honey production as a cross between the Italian and the black bees, on account of the manner in which they seal the combs, that of the hybrids being much whiter.

At the close of the honey flow enlarge the brood chamber to its full capacity again.

After having secured a crop of nice comb honey do not spoil it by slipshod methods of marketing. Put the honey up in neat clean cases holding a dozen sections each, having first thoroughly cleaned each section of propolis and carefully graded them. Time spent in this work is well and profitably spent.

Q.—What is the best size of no-bee-way section; which is the right width, 1 3-8 or 1 1/2 inches?



Mr. PETTIT: I have had no experience with no-beeway sections, I do not care for them myself.

Mrs. SCOTT: I have tried both, and I think  $1\frac{1}{2}$  inches clear section space is probably large enough. If you make it 1 3-8 inches wide and  $4\frac{1}{2}$  inches square, it looks small compared to the regular  $4\frac{1}{4}$  inches solid section. 4 by 5 by 1 3-8 is the best size of section I have ever come across.

Q.—Can as good comb honey be produced from old comb as from clean?

A.—If there is a quick sharp flow, I do not see very much difference, but if the flow is a little inclined to be slow, and if the sections are liable to be left on a length of time, of course the clean combs or starters will give a cleaner section.

Mr. V. J. BROWN: Why use dummies instead of the full number of frames and why are fences better than plain separators?

A.—Dummies placed at the outside where there is not likely to be brood keep the brood chambers free from honey, and there should be just enough comb for the queens to put the brood in. It is more important that the honey be crowded in the supers producing comb honey than in producing extracted honey, because we want the sections finished, and on this account it is better to have as little honey in the brood chamber as possible, and the dummies placed on the outside will crowd them to the outside.

Mr. H. R. SMITH: Do you find the sections as well finished over the dummies?

A.—I do not find any difference.

Mr. NEWTON: I do not like to interrupt, but there is just that question there of the fence separators, or no-bee-way separators, such as Mr. Bowen mentioned in his paper, that I have been thinking about. Mr. Bowen was in favor of no-beeway separators.

Mr. PETTIT: No-beeway sections and fence separator.

Mr. R. H. SMITH: These fence separators are made some with cleats and some without.

Mr. PETTIT: There is likely to be a ridge.

Mr. D. A. CHRYSLER: Does that spoil the honey for sale?

A.—No, there is room opposite that space where they can build out the honey just a little bit.

Mr. HOLTERMANN: The wire cloth separator leaves you without any ridge, and is, I think, the best.

Mr. JOHN TIMBERS: Is not this wash-board honey more liable to have the sections broken?

Mr. PETTIT: Yes, if there are no-beeway sections. I prefer to have bee-way sections.

Mr. J. M. SWITZER: I used fence separators this last winter for the first time, and I find that the combs are just about as smooth as ever. I think we had just as good comb honey this season as any other season.

Mr. HOLTERMANN: Was the flow comparatively light?

A.—Yes, not more than half.

Mr. J. M. SWITZER: In the short experience I have had in one season I am very much in favor of them. I think  $1\frac{1}{2}$  inch section is a little too wide.

Mr. JOHN TIMBERS: Would there not likely be more wash-board honey in a good season than there would be in a poor season like this?

Mr. HOLTERMANN: Yes, I think so.

Mr. J. F. SWITZER: I think a slack  $\frac{1}{4}$  inch would be better and I do not think you will have any trouble.

Mr. R. LOWEY: I have used some separators with a few holes bored in, and with even one hole opposite the sections, there would be a ridge there, and I think these wash-boards, as you call them, spoil the look of the sections.

Mr. PETTIT: Did you ever try 3-16 holes?

Mr. H. R. SMITH: 3-16 is the right size; I have used hundreds of them.

Mr. D. A. CHRYSLER: I had some difficulty in using these plain sections at first on account of them having this wash-board appearance. If you put another super on, you do not get this. It is too much crowding; you are not giving them room enough; that is the trouble.

Mr. ADAMS: In seasons like the last, I found no-beeway sections had more or less of the wash-board appearance.

Mr. PETTIT: Did the separator section come flush with the top?

Mr. ADAMS: Yes, flush with the top of the inside of the section.

The CHAIRMAN: I intend to ask Mr. Chrysler if he tried the wire separator.

Mr. CHRYSLER: I did, but it was too late before I got them on; but the results I had with them were very good.

Mr. HOLTERMANN: I had one hundred of the wire separators made. Mr. Betsner said it was absolutely necessary to have perfect workmanship and absolutely correct spacing. Perhaps some of you saw the illustration in *Gleanings* in connection with the Betsner separator, which was very discouraging. These wire separators are good for fifty years if you take care of them, because you can put them into hot water and clean them absolutely.

Mr. W. H. KIRBY, Oshawa: I generally use a single tier with tin separator which runs right through, and I find the bees will store just as much honey. I look upon these new things as mere fads.

Q.—Is it a fact that black bees, or hybrids, will cap comb honey whiter than the Italians?

A.—In my experience it is.

Mr. BROWN: Black bees produce the best comb honey; I have had them side by side with the hybrids.

Mr. R. LOWEY: That is my experience with hybrids.

Q.—Should the bee escape be placed in the centre of the board, or at one side, to be most effective?

A.—I think probably in the centre would be best. The only kind I have used is in the centre of the board; the bees want to get down to where the brood is, and this being above the brood would naturally draw them down. The best escape-board I have used is one made by Mr. Smith. I find that it cleans the super better than a single Porter escape.

Mr. McEVoy: I do not care what escape is used, it depends on how you use it. If you will raise the super a couple of inches they do not know they are cut off, and will go through the next morning and there will hardly be a bee there.

Mr. R. LOWEY: Keep hybrids, Mr. McEvoy, and they will know if you disturb the super.

Mr. J. F. SWITZER: I have had bees leave the comb honey super in four or five hours after putting on the escape, perhaps four escapes in the board.

Mr. M. B. HOLMES: I have had escape boards with the escape at the side, and I find they clear more quickly.

The CHAIRMAN: I saw Mr. Switzer's bee escape, and I thought it was a good one, and I am going to make one this winter. It is an invention of his own, and it is very simple and very cheap.



Q.—Why does not contraction of the brood chambers induce swarming again?

A.—It depends on the season. If the season lasts long enough, it does.

Mr. PETTIT: Mr. Bowen says he prefers foundation and one comb full of brood. The bees work in the supers, and by the time the brood chamber fills up again, the season is so near to the conclusion that they do not swarm again.

The CHAIRMAN: I think that can be accomplished by hiving on starter and giving room above. If you contract them, it forces them to swarm, but if you hive them on starter, they will spread over them. I would not care if you put an empty hive below, they would go right up and start on the foundation starters, and then you put on your sections, they will start right into them, because they will accept them more readily than they will the space below. Some people put a section that has comb in there to bait them, and that is what I recommend rather than dummies.

Mr. NEWTON: I am glad he said that; I knew he would do it. It is the same old thing, we have done it for years and years. Mr. Pettit or myself will never give up that; the dummy is far ahead of the other plan.

Q.—How do you use dummies with success?

A.—The only way I can get at the meaning of this question is that someone did not understand what dummies are. They are an apparatus cut the size and shape of the comb, and placed in the brood chambers at the outside. They are put in place of the combs so that the brood chambers will be contracted that much. Mr. Bowen has an eight frame hive, and he puts three dummies, I suppose two at one side and one at another, and leaves the frames, and these dummies are placed inside of the brood chambers, and it is contracted that much.

Mr. TIMBERS: Would not a division board answer the same purpose as a dummy?

A.—No.

Mr. BROWN: We adopted Mr. J. B. Hall's plan of driving staples into the side of the dummy so as not to have any further spacing.

Mr. PETTIT: That is the way I space on my frames, with staples.

Mr. NEWTON: Why place an empty super on top of a full super for comb honey?

Mr. PETTIT: The reason for that is that the usual plan is to place the empty super under the finished one. That is what the bees prefer, and they will go to work a little better in that way; but when we do that they practically work in the empty top until the empty super is brought on to the same stage of completion, and then they go on to complete the work together. If the honey flow continues, you have the two supers finished, but if it does not continue, you have them unfinished.

Mr. NEWTON: Do you recommend that through the whole season?

A.—No.

Mr. R. H. SMITH: Won't they swarm much quicker with full sheets of foundation than with starter?

A.—Yes.

The CHAIRMAN: I am going to ask Mr. Miller to answer the balance of the questions.

Q.—Is an eight, ten or twelve frame hive best for comb honey?

A.—I would take the smallest.

Q.—Will the last swarm, swarm out with the last virgin queen leaving the hive queenless? And why?

A.—I don't think I can offer anything on that.

The CHAIRMAN: I have known a colony to swarm that way, with only one queen and leave the hive perfectly queenless. I don't know why they do it, unless there is an abundant flow. Perhaps they are crowded, but I know it has been done in my experience.

Mr. JNO. TIMBERS: Did all the bees go with the queen or did they leave half behind?

A.—I think they left enough to cover the comb.

Mr. HOLTERMANN: What evidence have you that they did that. Did you see them swarm out and did you go to that swarm and find that there was another queen as well as your young queen?

The CHAIRMAN: Yes, immediately after they swarmed. I have known them to have only one queen, and I have seen them swarm, and I wondered why, as there was no queen left and nothing to make a queen.

Mr. HOLTERMANN: Were they hybrid bees?

The CHAIRMAN: My bees are hybrids, some Italians.

Mr. JNO. TIMBERS: I had a swarm come out in the same way, and I put them back, and the next day they came out again; I thoroughly examined them and finally they decided to stay. But the queen never did any good.

Q.—What strain of bees is considered the best for the production of comb honey?

A.—For instance capping qualities, I would say hybrids. You occasionally get Italians that will cap white, but others cap with a water coloring.

Q.—Shall we winter inside or out?

A.—It is a matter of choice and local conditions. I prefer outside wintering. I can do it outside with less inconvenience than I can wintering inside. I used to prefer inside wintering when I had only one yard, but I find the results are better in the spring from outside wintering.

Q.—Have you a double wall hive or a single wall hive?

A.—I use a case for four colonies. Not a double wall, just a single hive, four in a bunch.

Mr. PETTIT: Do you leave the bottom board tight and the cover on?

A.—Yes, just tight.

Mr. QUANCE: Do you ever find the entrance covered up with bees?

A.—No, I rake the entrance out if the snow blocks it up.

Q.—How do you fix the outside entrance to keep the snow from packing?

A.—I think it would be better to have a storm door fit over the entrance. I have studied that out for some years but have not perfected one to suit me.

Q.—Have you had any experience in wintering bees in a trench covered with straw and dirt?

A.—I have had no experience with that system of wintering.

Mr. R. F. WHITSIDE: I tried that a number of years ago when I had about six hives; I put them in just the same as potatoes. I dug a hole three feet wide and two feet deep, and I put straw and boards and dirt, and then straw and boards and more dirt, and I put a gas pipe up through for ventilation, but the bees stopped them all up. However, they came out as lively as bees ever did in my experience.

Mr. HOLTERMANN: I tried six or eight of them and they came through all alive, but they were a poor success, and I do not feel like repeating the experiment.



Mr. R. LOWEY: I have seen two cases of that and I advise you to take poor stocks to try it.

Mr. TIMBERS: I tried that with a couple of swarms. They were good when I put them in and the trouble was they came out too quick. When I wanted to take them out they were all out and gone.

Mr. R. F. WHITSIDE: Next year I tried eighteen, and I boarded them all up inside and the lower twelve were very easily carried out. On the top section they managed to pull through. I suppose I should put one report against another. The first time they were all right and the next time there were twelve gone.

Mr. HOLTERMANN: It is the regular practice in Russia to bury bees in the ground.

Mr. TIMBERS: The outside atmosphere would have something to do with it. The year I tried it we had a mild year something like last year.

The CHAIRMAN: My experience is that it would not be a very good thing to recommend to anyone.

Mr. W. J. BROWN: I have known it to be tried in our section of the country and it proved a failure.

Q.—Are not the forms, enquiring regarding crop reports, issued too early for many bee-keepers to give correct information as to a basis of prices?

A.—I do not think they could be issued too early for the benefit of beekeepers for market. The trouble is the other way. We need that report just as early as the honey comes from the hive.

The CHAIRMAN: It would be better if the beekeepers would not be so particular for having it just accurate. Do it as well as you can and send in a report. I think some beekeepers are so honest that they do not like to report until they have it all weighed up and know exactly what they have got. That is a mistake, as we do not want to know just to a pound or two.

Mr. HOLTERMANN: I quite agree to what Mr. Sibbald has said as to the need of estimating rather than waiting to know the exact amount. There is no use writing a man what his buckwheat honey crop is going to be about the 1st of August. And I would suggest that there be an attached slip which can be torn off and used as a fall report.

Mr. W. J. BROWN: Owing to the fact that the Department of Agriculture has got very good assistance, I think it might be gotten some way through the Bureau of Industries, and we might get these reports distributed among beekeepers, the same as they do their reports with regard to fruit, grain and crop of that kind. Some people think it is a combine, but if it came through the Department no one would have any hesitation in replying.

Mr. McEVoy: I think that is the most sensible thing I have heard. If the Government take hold of it, the people would have more confidence in it, and there would not be that feeling that it was a sort of trust or combine.

Mr. E. DICKINSON: The Department would not have anything to do with fixing the price.

Mr. HOLTERMANN: That is done every year, and has been done for a long time; but we would have our honey sold before we got the report.

Mr. EVANS: I think the present system is working satisfactorily. The Government send out their report as to the amount of honey produced. I answered the question, but did not estimate the quantity of honey. I think that is a question for the beekeepers themselves. I think they are the only people who are entitled to have that information. I do not think we need worry about buckwheat honey; it is not of much consequence.

The CHAIRMAN: I do not produce much buckwheat honey, but I know some people enjoy buckwheat honey just as well as clover honey. In fact, I have one or two customers who prefer it.

Mr. EVANS: I never knew a child who had a taste for whiskey, but I believe there are people who have acquired a taste for it, and I think it is quite possible you may acquire a taste for buckwheat honey. If I had to eat buckwheat honey, I would rather do without honey altogether. My bees will not gather buckwheat honey. I have bought buckwheat and given it to my neighbors to sow, but my bees will not gather it. I think the least we have to do with a handing our work over to the Government the better. I do not think it is necessary to hand it over to the Government. I am a little doubtful about having this information sent broadcast throughout the country, and I think it is a great mistake to put in the amount of honey. It is all very well when there is a failure, but when there is a good crop, I do not think it is advisable to shout it from the housetops.

Q.—Can colonies coming out of winter quarters queenless be properly queened in the spring?

A.—From my own experience, I will say no. You can send and get queens and introduce them, but I do not think with profit to the producer. It is too early in the season to handle a colony in that state profitably.

Mr. WM. McEVoy: If you had a strong colony and they lost their queen, would not you try to get a queen?

A.—No, I would unite it with a colony that had a queen but few bees.

Mr. HOLTERMANN: I do not like that answer to go into the report unchallenged. If I have a stock of fertile workers I never want to trouble them. I just simply shake off from the combs and that is the end of it. But in the spring of the year I have saved many a colony by having young queens come on and putting them in. I rarely ever unite stocks. I have bought queens in the south and had them come on in April, and saved quite a few colonies by doing it, and I think it paid me to do it.

Mr. MILLER: I am not saying that it cannot be done; it depends upon the amount of work and the expense you generally go to. We answer a great many of these questions from our own standpoint, and the way we believe to be most profitable to ourselves: To a man with a few colonies and wanting more, I would say get your queens from the south, but if more than 100, 200, or 300 colonies, I would never think of ordering a queen for the colony; I would raise my own queens; I would never think of shaking off a colony of fertile workers. I do not allow them to dwindle down until they are a handful. As soon as I find a fertile worker I take my hive off and separate the two brood chambers, and jar the bees out on the ground—I can do it in the time I am telling you—and I place the colony on the stand ready for the winter.

Q.—If you had a good strong colony in May without a queen, you would shake this into the next colony that had a queen?

A.—Yes, instead of re-queening that colony, I would unite it with another.

Q.—Why not introduce a new queen?

A.—Because there is no profit in it. If you have a small number of hives it would be all right to introduce a new queen.

Mr. MILLER: We are talking about colonies coming out of winter quarters.

Mr. McEVoy: You are right, I thought it was in May or some time in the spring.



Mr. HOLTERMANN: Certainly never disturb a colony when you come on to apple bloom. It seems to me there is more work in uniting that colony than there is in putting a new queen into it.

Mr. MILLER: In uniting a colony, I simply bring one up and set it practically on top of the other. They will unite themselves. I simply carry my colony over to the one I wish to unite it with.

Mr. HOLTERMANN: I find you can introduce a queen very rapidly if you do it very soon; if they are out it is very hard to introduce a queen, but if they have been in the cellar I find no difficulty in introducing the queen.

Q.—In taking a swarm on starters is it wise to put on queen excluder between section super?

A.—I have always practised it. If there were no bee comb in the sections I would certainly put on the excluder.

Mr. PETTIT: My experience in using queen excluder is that I am putting sections on regular stock. If I put on the queen excluder then, and a section on the top of that, in my experience it hinders the bees going up; but if there is no comb in the section, only just foundation, I put the section on without queen excluder.

The CHAIRMAN: Where shallow hives are used the excluder would be necessary. A deep hive would not need it so much because the bees would go further down on the comb.

Mr. PETTIT: You are not figuring on the rim of honey on top of the comb.

Q.—How do you like an engine for extracting?

A.—I may say that I have had one season's use of a gasoline engine for running an extractor and I like it very much. The fact that I can fit it for a gasoline engine gives me advantages; I am certainly pleased with it.

Mr. EVANS: What is the cost of the engine?

A.—\$145. It is a 2-horse-power engine.

Mr. HOLTERMANN: I was at Medina, Ohio, recently, and the people there sold me a gasoline engine which they guaranteed to do good work; the cost of it with connections was \$65.

Mr. MILLER: Mine was for installing outfit complete. I have a shaft and double belt running on three pulleys. I use the National Harvester.

Q.—There would be duty on the Medina machine?

A.—Yes, 30 per cent.

Q.—If an empty comb is put in brood chamber when hiving, on starters, will it be necessary to put on a queen excluder?

A.—With my systems I would do so. Mr. Sibbald spoke of the advantages of putting it in large deep frames. I presume that would be the case. I have always put the excluder on for comb honey and I keep it on.

Q.—What about the Alexander method of building up weak colonies in spring, is it a good one?

A.—I cannot say as to that. It is a plan more adapted to the Chairman's system than mine; I never tried it.

The CHAIRMAN: The system is to put two colonies one on top of the other with the queen excluder between them. Set the weak colony on top of the strong one. I put a queen excluder on top of the strong colony, and then a weak colony on top of that. Choose a colony right beside the one you are moving. Do not carry the colony from the other side of the yard, because if you do you lose the flying bees.

Q.—When would you do that?

A.—After they get some brood.

Q.—What is the best time to put bees in the cellar in the vicinity of Toronto?

Mr. KIRBY: Perhaps some Toronto man can answer that question.

The CHAIRMAN: From the 15th to the 20th of November would be my advice.

Q.—Would an uncapping machine be a very great advantage?

Mr. MILLER: From my own standpoint it would be of very great advantage. With an uncapping machine, and my gasoline engine, I could almost sit down during the busy season, provided the capping machine came up to my requirements.

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### ADDRESS.

By HON. NELSON MONTEITH, MINISTER OF AGRICULTURE, TORONTO.

I regret very much that my time has been so occupied that I have been unable to be earlier at your sessions. However I am here, and I am glad to meet the men who are forwarding the bee industry so well in this Province. I am sorry to learn that the past year has not been altogether a banner year in the way of honey production. However, there are certainly climatic conditions that sometimes affect results to such an extent that our labor is not always at fault. I am interested in being among you, not only for the good fellowship I have met at your hands, but to gather from you what you believe could be done in the way of legislation to advance the bee industry of Ontario. Last year we attempted some slight modifications of the legislation bearing upon your industry, and I believe that the coming session may see some other changes if you may see fit to urge upon the Government and show your conclusions are satisfactory. We are but your servants in carrying out what we believe to be in the interests of this industry.

I would like to gather from this, your annual meeting, something that would be fairly definite as to the views of the bee men of this Province. I do not profess to be a bee man in the sense of being able to advance any ideas, particularly in the way of legislation; however, I do know regarding the interests that you have in mind, that I shall only be too ready and willing to further your well-thought-out desires in the matter of legislation bearing upon this great industry. I think it is unnecessary for me to speak at any great length as to what in my mind should be done for the honey interests of Ontario. I tried to impress upon you last year that I thought the beekeepers of this country were not altogether alive and aggressive enough in the way of putting their products into the hands of the people. I still believe that what I said at that time was well founded. The value of honey as a food is little appreciated, and I believe there is a good deal of missionary work required on your part to put honey in its proper place in the bill of fare of the people of Ontario.

Not only that, but there is the way of marketing your goods. In fact, that seems to be one of the failures of the people of Ontario—not presenting our productions in the most attractive way. However, much has been done along this line, and I think very little may be said. This Province is rapidly growing in population. Bee-keeping to my mind, is something that is not wholly confined to those that reside in the country. However, you recognize the difficulty under which those labor who attempt to keep bees in crowded centres. There have been certain happenings in our courts during the last year that add to your responsibility, and that we cannot overlook in



the matter of taking care of bees. I do not know that I should further occupy the valuable time of this Association. I came here to learn as to your desires, and to judge as fairly as I can, how far they may be met.

The matter of inspection is something that has been changed somewhat. We have assumed direct control of that, and I am not prepared to say as to whether it has been an advantage or not. It is largely for you to say. However, I think that during the past year or two the complaints in this respect have been fairly met. We made every effort, so far as the Department was concerned, to meet with the demands that were put forward. I think it is only fair to you to say that there is one season of the year in which the necessity for the attendance of the inspector is of the greatest importance, and that season is somewhat limited in its duration, and I believe the work might be furthered by trying to meet cases that arise during that season of the year. Whether that might be done through an increased number of inspectors or some other method, I am not exactly clear about. I think possibly some suggestions you may give from this meeting may strengthen our opinion in that regard. There is a large territory to cover and for that reason it requires considerable effort. I am glad to be with you, and to know that your organization is such a live organization. I hear at a distance sometimes of your doings. You have some of the pugilistic qualities that endear the Anglo-Saxon to humanity the world over. You do not always agree to agree, and sometimes our best ideas are brought to the surface in that way. I wish continued success to the Association, and trust that another year nature will be more kind to us than it has been in the past.

The CHAIRMAN: We are glad to have the Minister here, and we appreciate the efforts of the Department in helping the bee industry. Some of us have had occasion to meet with the Minister and the Deputy Minister, and I feel assured that our interests are theirs. They are taking an interest in us, and they are going to help us, and I think that is only right. I saw some one the other day who said that the bee-keepers were the only class of people who could steal honestly, and it struck me that this is quite true. Honey is a secretion that if not collected will be wasted, and every year there is a great wealth wasted in the country where bees might be kept. I moved into the district I am in now, and the first year I got somewhere about 20,000 pounds of honey. I do not know that any of that would have been gathered if it had not been that I put bees there, and that is only an example of many places in the Province; so that the Department of Agriculture, by encouraging the bee industry, will help the wealth-producing elements of this country. They talk about digging mines and getting minerals out of the earth. In our business we do not have to dig at all; it is right there for us.

The foul brood question is a burning one. That disease alone has been a loss to me of \$2,000 for the last two or three years. I got foul brood when I had 300 colonies of bees. I had to reduce them to 150, and I have had just as much work with the 150 colonies; it has taken me about three years to get them back to 300. I can mention 20 apiaries where foul brood exists within 20 miles of where I keep bees. The matter of more inspectors will always have my hearty support. I am sure the Minister would like to hear from any of the bee-keepers here a few remarks on the questions he has talked of in his address.

Mr. McEvoy: The President said he lost \$2,000. I could have saved him that money. Mr. Hall, of Woodstock, had foul brood in his apiary and I saved him from great loss. I put it out of his apiary, and I could have done the same for the President.

## FOUL BROOD INSPECTION.

The following communication was read by the Secretary:—

Toronto, October 31st, 1906.

DEAR SIR,—Under instructions from the Minister, I beg to lay before you for consideration by your executive, and if thought advisable by your executive, to lay before the members at your next convention, a proposition whereby we think the relationship of this Department with the Association may be materially improved, the usefulness of the Association extended, and the interests of the bee-keepers better served.

We have found that it has been to the mutual advantage of the Department and other associations to have the relationship strengthened, and the work of inspection directed from the Department. You will recall that at the last session of the Legislature provision was made whereby more than one inspector might be appointed by the Minister, and the work of inspection directed from the Department. Owing to the lateness in the season when this bill became law, and also owing to the fact that your Association had already selected an inspector, it was felt advisable to continue your recommendation, and the work was begun somewhat late in the season.

We understand that the period of best inspection is somewhat short, and that, therefore, it might be advisable to divide the Province into six districts as follows:—

1. Lennox and Addington, Frontenac and East. ,
2. Victoria, Peterboro, Northumberland, Durham, Prince Edward, Hastings.
3. York, Peel, Simcoe, Dufferin, Ontario.
4. Wellington, Waterloo, Perth, Huron, Bruce, Grey.
5. Norfolk, Brant, Oxford, Elgin, Kent, Essex, Lambton, Middlesex.
6. Wentworth, Lincoln, Welland, Haldimand.

We think that it would be practicable to secure a good man for each one of these districts. In making the selection, the Minister would naturally consult with the officers and directors, as he would desire to appoint men who would be well informed and carry on the work with the approval of the Society. We would suggest, however, that the services of Mr. McEvoy be retained, and that he be given section number six, providing he would be willing to continue. This section is in the vicinity of his own home, and he would also be available for referring to him any points which might come up in connection with disputes in other districts. While we have in mind other bee-keepers for the other sections, it is not necessary to name them in this connection. It is the principles of the work and general lines of division that we submit to you for consideration.

This would necessitate a larger grant than we have at the present time. The Minister is inclined to think that next year a total appropriation of \$1,200 would be sufficient, as the inspectors would not have to travel so far from home, expenses would be lessened, and we should be able to cover a much larger area than has been done under the old plan.

In the next place, we have thought that, in order to carry out his work and keep it in direct touch with the bee-keepers, it might be advisable to have the secretary of the Association located in the Department. We are not anxious in the Department to monopolize any of the work or privileges of the Association, but if you think it would not interfere with the work of your Association in any way, but rather improve its working, to have the secretaryship here, we beg leave to say that that can be arranged. The Sec-



retary of the Fruit Growers' Association, Mr. P. W. Hodgetts, is an officer of this Department, and we understand that he would be willing to take the secretaryship of the Bee-Keepers' Association also. But that is a matter which we do not wish to force upon you in any way, but submit to you for consideration. You may consider the question with the utmost freedom. Mr. Hodgetts is not seeking it and we are not unduly urging it. We would hope to bring the work of the Association into closer relationship with our other branches of work, more particularly the Farmers' Institutes, and it is just possible that some improvement might be made to the advantage of the Association and of the Institutes.

Please have his matter considered by your executive, and oblige.

Yours very truly,

(Signed) C. C. JAMES,  
Deputy Minister of Agriculture.

A conference was held on the changes proposed in the foregoing communication, more especially on those relating to the matter of foul brood inspection. The discussion was full and free, and, on the whole, of a friendly nature.

Hon. Mr. MONTEITH, in closing the conference, said that as head of the Department of Agriculture, he wished to be given a reasonably free hand. It was his aim to keep the Department as far as possible from mere party control. (Applause.) He looked to the various agricultural associations for a large measure of co-operation, and felt persuaded that the bee-keepers of Ontario would also give him their assistance regardless of political feeling. He complimented Mr. McEvoy upon the good work he had done in the past as inspector of foul brood, and believed that both of them could still work heartily together. The Department intended to utilize the best ability procurable to develop agriculture in Ontario. (Applause.)

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## WINTERING REPOSITORIES.

By WILLIAM COUSE, STREETSVILLE.

My intention was to have taken up repositories I have seen, starting from the first time I knew anything about bees, and that was in the good old brimstone days, when every boy in October could smell brimstone for three miles. Every time bees were taken up at our home every boy in the neighborhood would know it, and he got there and got some of the honey. One particular repository that I recollect from boyhood was a pine log about six feet long, with a hole half way up in the centre as an entrance. At that time we had three hives made from pine lumber lined with straw inside. Where the difference was between that log and these hives was a question. That hive was supposed to winter for a good many years and never fail, and it did so; and as boys, we expected that hive to last forever. The conclusion that seemed to follow out from the whole system of wintering is that dampness perhaps is the greatest cause of failure in wintering. I did not know anything about bee-keeping then, but if you think of that log, there was always ventilation; it stood out right open. A few years after this my experience commenced, in seeing wintering repositories from those that were engaged in the movable frame hives. They were the first wintering cellars, and were not what you would call dry cellars, water lying in many of them.

I remember once seeing Dr. Tom's cellar when it had a great deal of water in it for quite a length of time, but his bees came out well. I would not say it was a damp cellar, but water was there for a short while, and finally drained off. It was on a hill. I remember another instance. A man who knew very little about bees, bought them late in the season, and in order to winter them, he put them in a glass house and he fed them every day. He said if they would not take it any other way, he would throw it over their backs; and he did so, and the consequence was he did not have bees in the spring. In a few years I went to Beeton, and the bees there were wintered in sawdust buildings packed from ten to eighteen inches with sawdust all around double doors. Some of those buildings were provided with a floor in the bottom and some without. They occasionally got somewhat damp in the bottom, particularly those that had no floor, and if there was any loss it was in the bottom row. I moved away from there and went into cellar wintering again. I came to Streetsville, and we wintered in a cellar with average success. A few years later I went into cellar wintering for myself at Meadowvale, but we had a good cellar and it was successful. We got our bees burnt there, and having no cellar we used a sawdust house, and the bees wintered fairly well. From all I can see, I must say that where the bees have been kept dry there are numerous ways of wintering them successfully. I remember going out to a farm on the centre road from Streetsville, where a man had a bee house like an ash house, and he had a box hive without bottom sitting on a trestle with a frame under it. The bees were in an open building 8 x 10, and he wintered them in that way for years successfully. It was not the heat, it was the dryness; I cannot think of any other reason. Since then I have done more or less wintering outside. When the bees were covered with snow to a great depth and kept damp, they did not winter as successfully as when kept up clear and away from dampness. Unless they are kept high and dry they are not so successful. I find that where the bees are wintered inside when you take them out not too early and set them down and cover them up, they are apparently better than those wintered outside. These last two years I noticed particularly bees that wintered in a cellar and were put out carefully, were in a better condition when the honey flow came on than those that wintered outside. I am satisfied where a man has a good cellar, conveniently situated, it is economical to winter inside. Last spring I put out bees at different times, and I found those put out first were not to compare with those put out later, as they seem to start breeding and afterwards dwindle down. Those that are put out late continue right through. This last spring, the bees that wintered outside were fine and strong, and those that wintered in the cellar were perhaps not so strong. I set some out on the 25th of March, and some the middle of April and some the 23rd of April. Those that were set out the month later were in a much better condition. I believe a man who has got a pretty good cellar is well situated. I do not think anybody could winter bees in a damp repository, but I believe they can winter them in many other ways.

MR. SMITH: We have had some experience in wintering in various repositories. Going back twenty-five years ago, our first repository was simply a blanket and the bees were packed in chaff. This was in Muskoka, where the winters are cold. The bees wintered all right. We tried a dry, sandy cellar, and it would save packing; but our experience was that they did not winter so well in a cellar, and at the time we did not know why. Of course, I now know the reason—it was dampness. We moved to Bracebridge, and had a special bee house built, and a special cellar, but before the cellar was



finished, we had to put the bees in, as the winter came on. The frost got into the cellar and, although it was a dry one, we lost more bees than we did any other winter. They were dry enough, but the temperature was too low, and it was just the same as a refrigerator. A neighbor farmer had bees, and he took very little care of them, and left the hives on a bench at the end of the barn, without any protection, and they wintered perfectly, although the temperature went down to 45 below zero. The extreme cold did not last more than a few days. Another reason why they wintered so well was because they were in old combs. We built another cellar, and put them under the house. We had a big stone cellar the full size of the house. We put the bees into it, trusting that the water would not get it. We did not have a drain. There came a thaw in January, and the water got in, and we had to bail out the water to keep the bees from drowning. They never wintered better. It was a mild winter, and I think the water purified the air. A neighbor in the next street had his bees in the cellar under his kitchen, and the bees came out in perfect condition. Mr. Shultz, of Tilbury, put his bees in a cellar and towards spring the water got into the cellar, and when he looked to see if the bees were all right, he found the hives floating around on the water; but they came out perfectly, as there was room enough for the bees to crawl out of the reach of the water. I have noticed when bees are in a cellar that the bees on the lower rows will never come out as well as those above, if the temperature is low. When the temperature is high, they all come about alike. An average temperature of 45 to 48 degrees, we have found to be a very good one, and water running through the cellar is no detriment if the temperature is high enough. I think the reason why bees do not winter so well in hives out in the deep snow is because the entrance gets blocked up and the moisture is retained in the hives. We have found that the cellar is the best method for wintering in this climate, and if the cellar is kept too warm, they will start breeding more or less before you can set them out. If they start in February, and you set them out early in March, they do not dwindle, for the simple reason that there are young bees coming to take the place of the old ones.

Mr. HOLTERMANN: Three years ago I was attending a Farmers' Institute meeting and had supper with a farmer, who took me out to his bee yard to look at some stacks of bees that had been wintering in chaff hives. The hives had upper stories on them, with just the ordinary roof. They had no packing in the upper story, yet these bees had wintered successfully through that very disastrous winter. I attributed it to the fact that they had been kept absolutely dry.

The CHAIRMAN: You have heard of the fool's luck.

Mr. HOLTERMANN: I have never had it. I think the first requisite is a dry atmosphere. I have no objection to bees brooding in the cellar, if they brood late enough, so that the young bees are hatching when you set them out. They immediately begin to fly, but where they brood earlier they disturb the colony.

A MEMBER: If it is desired to have them brood earlier, how would you start them?

Mr. HOLTERMANN: I did not say it was desirable, I said I did not object seriously to it.

Mr. HERSHISHER, of Buffalo: If it is desirable to have young bees coming on to take the place of the old ones, then I think it would be a good plan to set the bees out late, and then you have a good temperature to start them in. It has occurred to me that if we were to put water where the bees could get at it, that it might start them to brood. I do not think it is well for

the convention to get the idea that water in a cellar will make the cellar dry. You all know a cellar that has water in it is supposed to make the house unsanitary. If the house is kept warm, I do not think dampness in the cellar will do any injury. I would think dryness in the hive is the best thing you can have. The colony should be large enough to store up warmth to maintain an even temperature, that is all the good there is in a chaff hive. You know that a large body will give out its heat gradually and not cool off quite so quickly as a small body. A hive with thick walls has the property of giving out the heat gradually. When we had a disastrous winter three years ago, I found the three story hive with bevelled edges had no winter protection at all, as the queen excluder had been left off, and yet the colony was alive; there was nothing but the lid of the hive over the upper story and the queen excluder. The following winter was a very severe one for me, and the colony of bees that wintered best was in a simplicity hive, and the hive set right flat on the bottom board with a sort of V-shaped entrance. When I took the bees out of a snow drift I found the entrance clogged with ice, and I had to pick it out with my knife, and when I cut it open the water floated out. It was thoroughly sealed with ice that held the water in there, and that colony of bees was the best I ever remember of having, and I have got the queen yet. They were apparently asleep when I opened them up.

Mr. BYERS: I suppose any bee-keeper can go home and say there is no use having a good cellar and having box hives. However, I do not think any of the gentlemen would winter 300 colonies of their own in the way that has been mentioned here. Wintering outside in such an exposed way is done at the expense of stores. I had a hive that stood six winters; the hive was made of inch lumber with entrance one inch by five. There was a check in the timber and I could look in at any time and see the bees. It was a twelve frame hive thirteen inches deep. Really strong colonies with abundance of stores will winter almost under any conditions, but they will use about a quarter more supplies than colonies of the same size that are protected with chaff. I have never lost a strong colony except where they starved to death. I see no trouble in wintering a good, strong colony, provided you can give them lots of stores.

Mr. LYONS: Do you keep your doors shut?

A.—No.

Mr. HOLTERMANN: The entrance would go half way up to the top of the hive?

A.—I mean the area, I do not mean the vertical entrances.

Mr. McEVoy: Mr. Couse spoke of giving them plenty of air and Mr. Smith spoke of giving them ventilation.

Mr. SMITH: I did not explain that. Of course these hives were packed in leaves from this opening at the rear end of the hive, so that the cold air could get through that bagging but very slightly.

Mr. McEVoy: I do not want more than four or five inches of leaves on top. If I was in Mr. Smith's country I would winter outside.

Mr. HOLTERMANN: Is it not a point as to whether these young bees get to fly early or not?

Mr. McEVoy: They disturb the hive.

Mr. SMITH: Have you examined them to see?

Mr. McEVoy: I could tell any hive in a yard without looking at it.

Mr. HOLTERMANN: How do you tell?



Mr. McEvoy: By the entrance; you could tell by the sound.

Mr. HERSHISHER: Is it true that bees have got to have water in order to rear brood?

Mr. McEvoy: No.

Mr. HOLTERMANN: Some of the German writers advocate giving bees water in the winter time to keep them quiet.

Mr. MILLER: Both Mr. Smith and Mr. McEvoy mentioned that they consider it necessary to give upward ventilation; for some years I have wintered without upward ventilation.

Mr. HOLTERMANN: I have had grave doubts for several years as to whether I was doing right or not. I used to winter with the covers off and cushions or felt above the quilt, and for two years I have wintered with the covers on, but raising the hives at the back. I have them in a good cellar.

Mr. HERSHISHER: I should say Mr. Holtermann was doing a wise thing, because he only lost six hives out of 300.

Mr. HOLTERMANN: I have wintered with a loss of less than that, but I do not think I have reached perfection. You should not lose a colony if you would put them up properly, any more than you would lose one sheep out of a flock.

Mr. BRUNNE: I gave up outdoor wintering entirely. I believe the cellar is best. I have three rows in my cellar which is on a hillside, and I think that it is a proper place to select for a cellar. It should never be on a level. I have found that dampness is needed to winter successfully, so as to allow a certain amount of dampness to come through. I simply take the covers off and leave the honey board on. I do not use any quilts; I put in two little wires to keep it on so that it won't work off, leave the bottom board outside, then put them on scantling, and leave an eight inch space between each of the hives, so as to leave room. I have a view any time in the winter, and can see what each hive is doing, and feed them if they need feeding. I have never lost one hive. I use an eight frame hive, and never take out an empty frame.

Mr. PETTIT: Did you nail your honey board down tight?

A.—I never like to have them nailed down so that the air won't come through the cellar and through the hives.

Mr. HOLTERMANN: When you set one hive on top, the two hives constitute a bottom board practically. I saw a lot of hives wintered that way in Quebec Province, and the man was very enthusiastic about it.

Mr. BRUNNE: In the spring I simply lift them out, put the bottoms under, place them on the stand, and I have no more to do. I lift them on to the bottom board in the cellar, close up the entrance and leave it closed up after I get them out until they quiet down.

Mr. GROSJEAN: I have wintered with the top covers on and without covers at all. Some years ago I wintered with the covers on, and I found there was dampness, so I took the covers off. I wintered somewhat in the same plan as Mr. Brunne. I never put on a cushion. I used to winter with the cushion on, but I never could find out why I did so. I try to keep my cellar right; never allowing it to go below 45. I set my hives about a foot and a half from ground; I have never know of brooding in the cellar. I fed one hive last winter and it gave me more honey this summer than any hive I have ever had.

## APIARIAN APPLIANCES.

The first order of business was the discussion on apiarian appliances, the first exhibit being of a smoker brought by one of the members. Mr. Miller was called on by the President to give his opinion on the different kinds of smokers in use, and his ideas as to the size of smoker required.

Mr. MILLER, in reply, said that he recommended the use of a larger smoker than the one exhibited, and thought that one with an area of ten and a half inches should suffice. The one he used was a large one, and he had to use it between his knees. He strongly advised the bee-keeper with anything from 100 colonies up to use a large smoker in preference to a small one.

Mr. McEvoy, said that he too preferred one of a good size, stating that the little smokers were a nuisance. He also said that he had not worn a veil for thirty years, and had been trying to train his son to throw it aside too. With the aid of a smoker, he could go through a yard and smoke 40 to 50 hives in 30 minutes and advised every bee-keeper to use a good sized smoker.

Mr. HERSHISHER (Buffalo), in reply to Mr. McEvoy's remark as to making his son discard a veil, asked if there was a Society for the prevention of cruelty to children? (Laughter.)

Mr. HOLTERMANN said he had not brought the smoker to the meeting for the purpose of showing its size or the material of which it was made, but to explain the principle on which the top was put upon the barrel. In private conversation it had been suggested that it would not work, but would clog; he had used that smoker the whole of the present season, and had found it worked most effectively; should soot form, all one had to do was to take a lead pencil and remove it. He considered that there was an art in the use of smoke and the smoker. He had been induced by Mr. Jones not to wear a veil, and had suffered considerably the first year, and he had to persevere persistently, in spite of many stings, before he could get accustomed to do without one, but on the whole he considered that it depended entirely upon the way in which one breathed. The bees do not like much steam about, and it is objectionable to have bees buzzing about one's face, but where it is necessary to disturb the bees it is perhaps advisable not to smoke so heavily.

Mr. BYER said that during a trip he had taken two or three years previously with Mr. McEvoy, he himself had worn a veil whilst Mr. McEvoy had made use of a smoker alone, and he considered that Mr. McEvoy required a very large smoker, for where he had been stung once or twice, Mr. McEvoy had had two or three dozen.

Mr. HOLTERMANN asked if it would not be better to smoke too much than not enough.

Mr. BYER said that a good bee-keeper ought to know how much to use his smoker, and described the use of a smoker, its advantages and disadvantages, taking off the cap and showing how the bellows and cap should work, and stating that a large smoker has the advantage of not requiring to be replenished as often as a small one.

Mr. NEWTON said that he believed every good bee-keeper could tell when the bees had had enough smoke by the sound. He said that he strongly advocated the use of the veil, not on account of the stings, but he believed that more work could be got through with the veil than without, and that that work could be more perfectly done.



Mr. HERSHISER said he did not believe in being foolhardy in working with bees, but that he very seldom wore a veil.

The PRESIDENT remarked that some people could be stung and not feel it.

Mr. NEWTON declared that he did not like the sensation of bees crawling all over him, nor did he like being stung or hurt, and he advocated the use of the veil. He did not wish to get stung simply for the pleasure of saying he did not wear a veil. He did not believe in using so much smoke, either. He considered there was too much smoke used all round, and that occasionally the flavor of smoke entered into the honey and made it unfit for the market. He said that bee-keepers should use as little smoke as possible, and by using a veil this could be obviated. He thought it was best to use means that would produce the largest amount of results. Should a smoker be used, a large smoker was preferable to a small one, as it did not require filling so often.

Mr. HERSHISER said he considered the Bingham smoker far ahead of any other, as it had a good draft and kept fire a long time.

Mr. MILLER, describing the working and different parts of his smoker, recommended it on account of the improvements it had.

Mr. McEVoy said that in extracting seasons he used as little smoke as possible, and followed Mr. Dickinson's plan of lifting a whole row of supers at a time and shaking the bees out. He considered the Paterson smoker as good as those of American make; it is a large smoker too. The smokers he usually found on his rounds were not of much account.

Mr. HERSHISER remarked that all Canadian articles were of superior make.

Mr. LOWEY said he liked the smoker which was being exhibited there if the bellows were turned around, but he would throw the nozzle away. He also advocated the use of little smoke, stating that he used a smoker and a veil when working in his yard.

Mr. BYER asked Mr. Lowey his opinion as to the use of the bellows.

Mr. LOWEY stated that he could not use bellows with his feet, but could always use them with his hands, but it was a matter of getting used to it.

Mr. BAILEY (Bracebridge) thinks there is a good deal in the management of smokers as there is in the management of bees. He advocated the use of a large smoker, as with plenty of fuel it lasts a long time and produces less smoke. If grass is put in the nozzle, and a little in the bottom of the smoker, it will give better smoke and better fire and not so much work. He was in favor of lighting the smoker at the top instead of at the bottom, as it works much better that way.

Mr. TIMBERS stated that he had tried the plan of using grass—and green grass, too—and it kept the fire down, and therefore kept it cooler, and prevented so much moisture around the top of the smoker, which shortens the life of the smoker by half.

Mr. W. BRUNNE gave it as his opinion that too much smoke affected the honey, and that in the time of the honey flow no smoke at all should be used. He thought that it all depended on the handling of the bees, and he could not complain of being stung.

Mr. HOLTERMANN asked him how many colonies he ran.

Mr. BRUNNE replied 110 was the number he had, and again emphasized the fact that he used as little smoke as possible.

## BEE-KEEPING AS AN OCCUPATION FOR WOMEN.

BY MISS M. TREVERROW, MEADOWVALE.

As a rule, to the woman who has had no practical experience with bees, if she thinks of the subject at all, bee-keeping stands for honey, large profits, studies in natural history, and stings, the latter probably being considered the surest and most objectionable adjunct of the business. But a few years' acquaintance with the little pets will teach her that stings are but insignificant incidents in the bee-keeper's life, that honey is not always sure, nor profits always large, but the study of the nature and habits of the bee can be depended upon at all seasons of the year to yield a fund of interest to any woman who engages in this occupation.

The story of my experience with bees is probably my best means of showing what bee-keeping may be as an occupation for women.

I started bee-keeping in 1900 with one colony, for which I had paid \$5. They did not swarm nor give any surplus honey during the summer, were weak in the following spring, and gradually dwindled away till the hive was empty. I purchased another colony for \$6 in May of 1901. When they swarmed I divided the bees and brood in the old brood chamber, putting half into a new hive and alternating each with frames of foundation. From the next swarm I received 30 lbs. of surplus honey. For the spring of 1902 I had three colonies, which had given me so little trouble that I thought I could manage a couple more. I purchased two more strong colonies for \$15. When they started to cast out first, second, third, and fourth swarms, I began to have some idea of what bee-keeping meant, having double brood chamber in 8-frame Langstroth hives. The swarms were large, and when two swarms issued at the same time I had enough to do to lift the double hives away and replace with new ones before the bees began to return, the queens being clipped. I had heard of twenty swarms issuing at the same time in large yards, but two at a time were enough for me just then.

Those five colonies gave me 928 lbs. of extracted honey and increased to sixteen. At the end of the next season I had thirty-five colonies, and 1,400 lbs. of honey from them. I had thirty colonies in the spring of 1904 and 1905, five having died in the cellar. They yielded about 2,600 lbs. In the spring of 1905, I had thirty-three colonies when the weak ones were united with the strong ones; they stored 4,700 lbs. of honey and increased to forty-nine. Last spring (1906) the numbers decreased to forty, five being queenless and four too weak to go alone. They yielded 1,600 lbs. of honey this year, and I have thirty-nine colonies this fall.

As to stings, my first serious experience with them nearly put me out of business. It was when I had only five colonies. They seemed to be trying to make a record of 200 lbs. per colony for that season, and when I attempted to take the honey off, they resented my interference with their plans with such vigor, that I left the hive open and ran to the house saying to the folks when I got there, "There is no use talking about getting used to stings; I will never be able to stand such punishment as this; it is too much for me." But I did not like to be beaten by the little bees, so I fortified myself against having another attack by covering my hands and wrists with long, heavy gloves and succeeded in taking the honey off. Ever since that time I have worn gloves in handling my bees. Even when clipping queens I use gloves with finger tips cut off. I know that the wearing of gloves is not looked upon with favor by the professional bee-keepers, but when it comes to a question of gloves or defeat, wear gloves.



There are other things connected with the occupation, that are not very agreeable. The stickiness of the honey in uncapping, extracting, weighing, and pouring into cans, which has won for the male bee-keeper the title of "Lick Thumbs," is one of its mildest miseries, so easily reduced to insignificance by the use of water, as to be scarcely worth mentioning; only, we are treating bee-keeping as an occupation for women, and she who takes it up is sure to find that this feature certainly belongs to it.

She may expect, too, considerable hard work and heavy lifting, for in handling 8-frame Langstroth, one of the smallest hives, there are many 60 lbs. lifts, and if she be incapable of lifting that amount, a woman is likely to be handicapped by her inability to move or carry a full hive or super, or a 60. lb. tin of honey. It is well enough to depend on outside help for big days when carrying in supers of honey for extracting, or in weighing it and crating for shipment or conveying the bees to their winter quarters, but for the common everyday work of the apiary which requires much muscular exertion, the woman who aims to be an efficient bee-keeper cannot afford to depend too much upon outside help.

Bee-keeping may be looked upon as a healthy occupation for women in comparison with many of the avocations to which she is called wherein exercise, fresh air and sunshine are denied her. It is true, there will be times when the humidity of the air and the intense heat of the sun, aggravated by the exercise she is forced to take, through excessive activity of the bees consequent upon these weather conditions, may lead her to exclaim, "Why was I ever born to be melted like this?" But these conditions only last for a few hours in a day, and not very frequently through the season, and there are so many rare, beautiful days to enjoy during the honey harvest, that one forgets the discomforts of a few hot, damp, wilted hours, in the pleasure of those when air and sun and bees combine to make the bee-keeper's life worth living.

One very important part of the business is the melting of old combs. It is hard, sticky work to cut wired combs out of the frames and put them into the extractor. It is difficult for a woman to lift the lid handle, screw and press off the extractor, without getting upon a chair even though she be strong and tall, and this has to be done every time the extractor is filled with combs. The heat, steam, and the odor of hot wax, pollen, etc., make this one of the most objectionable features of bee-keeping; but as house-cleaning, with its dust, disorder, and discomfort, while in progress, proves such a delight to the housekeeper in its results, so comb-melting amply repays the bee-keeper by the improved sanitary condition of the hives; and from what we learn from conversations with experienced bee-keepers in bee journals and deductions from papers read at conventions on the subject of healthy disease-proof colonies, the renewal of clean new foundations in the hive forms a very important factor in insuring healthy conditions in the apiary.

And the possibility is that if woman with her natural house-cleaning proclivities should invade the realm of bee-keeping, this branch of the business would be well attended to, and the problem of foul brood solved without any other formula.

There are many things in connection with bee-keeping that a woman can work at with genuine pleasure. Take that of opening up a few crates of bee supplies, and transforming the neatly made and precisely fitting pieces into hive bodies, bottom boards and cover frames with top, bottom and sides of white, clean wood that fit each other just like a charm and fit the hives just as perfectly. Then there are the folding of sections, the wiring of frames, and imbedding wire in foundation, etc., all neat, clean, fascinating features of the business.

My advice to the woman who wishes to take up this work would be to spend a season with an experienced bee-keeper, if she has the opportunity, paying strict attention to every detail of the work. She would gain thereby much knowledge that, if won by her own experience, would cost her dear. An instance in point of this; I had been told to put an empty super under a large swarm to give them room to cluster and prevent them from swarming out again. I only grasped the one idea, put the super under, and I did not note that it should be taken away at a given time. The consequence was that a colony did not make as much honey in the supers, and in the fall when I strove to take out what I supposed was an empty hive body, I found a peck or perhaps a half bushel of trouble accumulated there in the shape of combs built towards all the points of the compass, young brood in all stages, hundreds of bees crushed between combs that had fallen when the hive was lifted off, and a possibility that the queen was killed in the general mix-up. To have seen this done properly would have saved me time and expense.

In conclusion, this record shows that a woman may expect the little busy bee to gather honey for her at an average yearly rate of 61 lbs. to the colony; that stings may be subject to her will; stickiness also; that hard work, heavy lifting, perspiration, and disagreeable odors must be borne with fortitude; that careful attention to detail is imperative; and that there are many things in bee-keeping that are calculated to make it attractive and enjoyable, and also a profitable occupation for women.

The PRESIDENT in opening the discussion on the above paper said that he considered the reading of a paper by a lady a most pleasing feature of the meeting, and that, though several of the ladies present had been reluctant to speak or give their opinions on bee-keeping, he hoped that now that they had heard the paper read they would reconsider their decision and give their criticism on it.

The ladies however did not seem anxious to open a discussion.

The PRESIDENT: I do not think there will be any objection to the gentlemen criticising the paper. I think it is an excellent paper, and probably there may be a few things brought out there which would point to a better way of keeping bees.

Mr. HERSHISER: There are two kinds of criticism, one sort that points out deficiencies and one that points out merits, and it is this latter that I would call attention to. There are too many women who think they are not suited to take part in a convention like this. I am glad that this paper has been presented here. It shows what may be accomplished. There are a great many who have the ability and do not think they have. We had a lady bee-keeper in Buffalo, and she had about 100 colonies, and as her family was rather unfortunate she kept working these bees and made a living for herself and her husband, and finally when the husband went blind, this woman kept on working with the bees. Before he went blind he did the heavy work and she was the bee-keeper. After a time she grew old and died, and the bees gradually went down until there was nothing left of them. That showed that she was the bee-keeper. We have many lady bee-keepers throughout the country. Dr. Miller's sister, Mrs. Wilson, is quite a clever bee-keeper. She understands them quite as thoroughly as Dr. Miller himself, and we come across others occasionally. I am very glad to see that ladies are taking this up as an occupation. Of course, the lifting part of it is an objection to their working with it, but if they will look round they will find help and let an experienced person do the work.



Mr. DICKINSON: I highly recommend the lady to employ some help in the lifting. I think ladies can show excellent management in the way of keeping bees, but the problem of lifting hives is a difficult one; it would be well to have that overcome by employing some help. They would find it money well invested to pay a good price to get this help. I have tried as much as possible to keep away from hard work personally. When I hear such a paper read, I consider the lady that could write such a paper quite capable of managing a yard.

Mr. BYER: I think that is one of the best papers I have ever heard read. I think we shall have more ladies on the programme next year. There is nothing in that paper to be criticised. As regards this matter of lifting, I do that myself. I have one of the best helpers, but not to do the heavy work. Ladies can get someone for the heavy work just as I got someone for the lighter work.

Mr. DEADMAN: Speaking about heavy lifting, I think this can be avoided by using a proper hive. Also, if you use a wagon instead of a wheelbarrow you will save yourself a lot. By forethought the lifting can be easily avoided.

Mr. CRAIG: I am very glad indeed that the Executive put this paper on the programme. I think that apart from everything else, we have, as an Association, overlooked the ladies' part in the work. We know the excellent help afforded us in our work by Mrs. Smith and Mrs. Armstrong, and I consider they are well worth having a place in our programme.

Mr. TIMBERS: This point of bee-keeping for women is in my opinion an important one. I always make a point of reading the papers to my wife, and she says what I read will do in theory but not in practice. I shall certainly read this report to her. I think when she sees what this lady has accomplished in bee-keeping, she will consent to become a bee-keeper herself.

Mr. HERSHISER: As to heavy lifting, I like it. When I go round and have to lift the hives to find out how much they weigh, if there is enough for winter I feel highly exhilarated over the situation. (Laughter.)

Mr. ROACH: I think the ladies do the principal part in bee-keeping. I think we should stimulate the idea of ladies going in for bee-keeping. The ones who help me often draw my attention to mistakes in the yard. If they cannot do the heavy work they can do the light work, and it is very important that we should have their help. I have had two, and find in both cases that they gave me most efficient help. I should have missed colonies but for their observation.

Mr. HOLMES: I think, from the evident interest that has been taken in this subject, that it is certainly a very pleasing matter that this paper has been presented. It will be very beneficial and far-reaching in its results, as it will come out in the public press, and will be published in our annual report, and will create an ambition in the minds of the ladies in this land, if not only to manage bees but to perhaps manage the bee-keepers a little better. (Laughter.) This is a most excellent paper, and has indeed been a pleasure to me.

Mr. TAYLOR: It is one of the most interesting papers I have heard for a long time. It seems to me that bee-keeping is practically in its infancy. We have a field open for ladies in the light work, which opens up a greater area for bee-keeping than ever. This paper is most interesting to all present and I am very much pleased to hear such a chorus of approval. The young lady is well worthy of filling the position she undertook. She deserves a great deal of congratulation in having broken the ice.

Mr. COUSE: I am not at all disappointed in the paper. It was my pleasing duty to write Miss Treverrow inviting her to write a paper. I

wrote her that the Committee would like her to do so, she replied that she did not consider herself capable of writing one. I told her the responsibility would be mine, and the Committee's, that we would take all the blame. Now, the Committee is ready to take just a little of credit, for I think no one is disappointed.

### RETAILING HONEY.

Mr. JOHN TIMBERS took charge of the Question Box on the above topic.

Q.—How would sugar barrels do for candied buckwheat honey?

A.—I would say in this instance, "Silence is golden," but I will try to answer to the best of my ability. If it would hold the buckwheat honey till it is candied, I think it all right.

Q.—How can I get 10c. per lb. every year for my extracted honey?

A.—Put nothing on the market but first-class quality, and in good shape, and get your customers to depend on you from year to year.

Q.—Is it advisable to sell buckwheat honey to customers, who have been used to clover honey, even if difference in quality is explained to them?

A.—I would never offer buckwheat honey to a customer unless he asks for it. Some prefer buckwheat honey for their own table, while others prefer the white honey. I am retailing buckwheat honey at 9c. and the other at 11c.

Mr. HERSHISER: I would like to ask Mr. Timbers if he considers buckwheat honey as good as white honey.

A.—It is a matter of taste entirely.

Mr. HERSHISER: If your customer comes to you and says he prefers buckwheat honey, why not sell it to him at the same price as the white honey? The bee-keeper has insisted upon it that buckwheat honey is not quite so good and therefore is obliged to sell it at a good deal less; now to some persons it is a good deal better than the white, and why not sell it at a higher price?

Mr. BYERS: I have this year a shortage in the clover honey crop. My customers would, I think, take buckwheat honey; two or three of them do already. I have, however, refused several that wanted 50 lbs. of buckwheat honey, as I know it would knock out the market for clover honey, and I do not know whether it is advisable to sell buckwheat honey, as it pulls down the market.

Mr. ROACH: Buckwheat honey is a great deal in use. I did not want buckwheat honey round my place at all; but the last two years we have had a large stock of it, and I began to use it, and now I like it much better than I thought I should. Customers will come and ask for basswood or clover honey, and when I say I have only buckwheat they take it, and then they get to like it and come back for more. I am sure if buckwheat honey was used more frequently it would be liked as well as clover honey.

Mr. HOLTERMANN: This year I have handled 30,000 lbs. of buckwheat honey, and last year I handled more. It is very important that buckwheat honey should be well ripened; the difference in flavor between green and well ripened buckwheat is more marked than between green and well ripened clover honey. You can go to many places where buckwheat honey is produced, and it is preferred there to white honey. I am not saying it is superior, it stands on its own merits. It is accepted and liked in a great many places, and the more it is used the more it is liked; and for that reason I see no objection to offering buckwheat honey to a person who may ask for white if you have not got it. It may not be advisable to load them up with it, but I would advise them to buy a small quantity to test it.



Mr. TIMBERS: With regard to what Mr. Hershiser said about charging the same price for buckwheat as for the other, I would not like to give the same price for buckwheat honey, and would not have cheek enough to charge it.

Mr. HERSHISER: Just because it has become customary to sell it for less, and of course we have to do as the others do.

Mr. PETTIT: In this matter of buckwheat honey, I find that if the honey is well granulated it is much more palatable. When well ripened it is superior, and can be used as table honey. I like the buckwheat honey as well as the white.

Mr. LAING: I think Mr. Hershiser has made a good point in speaking of the price of buckwheat honey. I think it would be a very good idea to raise the price. Personally, I am fond of clover honey, and I do not know that I am particularly fond of buckwheat honey; but suppose I was just as fond of it as I am of clover, why not pay the same price as for the clover honey?

Mr. HOLTERMANN: It is a question of market values.

Mr. LAING: Of course it is. I think it would be a good idea to raise the price if we can. It is worth every cent as much as clover honey to those who like it.

Mr. BEAUPRE: I think buckwheat honey is sometimes a little off flavor. It is mixed with other flowers, and you do not get the genuine thing.

Mr. LOWEY: I have heard a good deal said against buckwheat honey since I came here. I am a buckwheat man, and I always use it. It is a rich, fine honey, and I know many people who prefer it, and ask me to exchange and give them part buckwheat at the same price. I can see no reason why buckwheat should not be worth as much as clover.

Mr. CHRYSLER: I think it best to sell honey according to the demand and supply. I think there should be a difference in the price between the buckwheat and the white just as there is in the price of grain, and the price must be regulated in the same way—by the supply and demand. If you were to charge the same price for the buckwheat as you do for the clover you would find you had very much left on your hands unsold.

Mr. TRINDER: Talking about buckwheat, you say it is not worth as much as the white. I live in a buckwheat district, and always find that customers will take buckwheat honey in preference to white and say it is the best honey they ever bought. I sell it at 8c. a pound in the stores, and that is all you could get for the white honey. One man will tell me the buckwheat just suits his taste, while he finds no flavor at all in the white.

Mr. BROWN: It is simply the supply and demand that regulate the buckwheat market; it is just as good as the white honey to those who like it. It is according to the taste of the consumer. My experience is that some customers like buckwheat; but most are in favor of the white.

Mr. CRAIG: Many think that buckwheat honey cannot be spoilt. Well, it certainly can, and it is one of the honeys that will not stand liquefying. If you can supply fresh liquid honey it is all right, but if you attempt to liquefy the granulated honey it is not the same honey.

Mr. KIRBY: I have a good demand for buckwheat honey. I put a notice in the local papers that I have it ready, together with the price, and it sells well. A great many rich people have a liking for buckwheat honey, and I soon get rid of quite a quantity in a few weeks.

Mr. HERSHISER: I would like to take up two points. One is in reference to the liquefying of buckwheat honey. If you take time you can bring it out just as good as the white honey. The second point is with reference

to its value as compared with white honey. The National Biscuit Co. used to buy honey from California in large quantities. Such honey is as good in quality as any honey, and they buy honey from Wisconsin, basswood honey, for using in the baking of their goods. Now, I can sell them buckwheat honey at just exactly the same price.

Mr. TIMBERS: We must finally decide it is either a question of management or one of locality. I think it is locality.

Q.—Would you advise charging more than wholesale prices in rural districts?

A.—Certainly; I charge retail price, and I sell to all alike. I have only sold 700 lbs. wholesale since I kept bees. In 1903 I had a big crop and I sold as much as I could and the rest I held over until the next season.

The PRESIDENT: That is a good point—holding it over.

Mr. HOLTERMANN: I do not understand Mr. Timbers saying every man should retail his honey. I wholesale what I can. Would it be better for more people to retail?

Mr. TIMBERS: I do not mean to say that all should retail their honey. Just get round and see how much you could retail; there would always be that much less for the wholesale market.

Mr. LAING: Do you mean to say that you can sell from the house?

Mr. TIMBERS: Yes, I have done so.

Mr. LAING: This gentleman says that he can sell from the house, and there is not another house within half a mile of yours. Did you go and solicit orders?

Mr. TIMBERS: No; I never went round to anyone.

Mr. DICKINSON: I have done the same thing.

Mr. LAING: At what price?

Mr. DICKINSON: At the market price, that is, the retail price.

Mr. HOLMES: I think a man is very fortunate if people will drive for miles to his house and pay him the market price.

Mr. LOWEY: I have never solicited an order; people come several miles and get from 2 to 3 lbs. up to 100 lbs.

Mr. LAING: I like to do everything I can to encourage retailing. I understand a man near me has been selling his honey at 8c. a lb., and people have been driving miles to get it at a wholesale price. They will not get a pound of honey out of me under 10c.

Mr. HERSHISER: Why don't you buy that honey?

Mr. TIMBERS: If he bought that honey would it be a credit to his trade? Half the honey we get put up by the farmers would not be a recommendation to any man to build up a trade on. It is inferior in quality and in the shape it is put on the market.

Q.—What is the best selling size and shape of section for comb honey?

A.—I do not pretend to answer that question; I never needed a super. Last year there was a discussion on, and I asked my friend Mr. Pettit what kind of super he would recommend. I made thirty during the winter, and I have packed them away ready for next year. That is all I know about comb honey.

Q.—Is it advisable to retail honeydew at the Toronto Exhibition or anywhere else?

A.—No, it is not advisable.

Mr. McEVoy: Is it advisable to sell it at all?

Mr. TIMBERS: No, it is not. It would only damage the reputation of the man that sells it, and the reputation of our Canadian honey at large.



Q.—If you were getting and asking 10c. per lb. for your honey, would you refuse to accept an offer of 11c. or 12c.?

A.—I would run away from that man and hide somewhere. I would consider he was a lunatic. (Laughter.)

Q.—Which is the best way to sell honey—by the barrel, or by the can?

A.—I suppose it is in 60-lb. cans. I never sold it in barrels.

Mr. McEVoy: It is the same price, I suppose.

Mr. WHITESIDE: They usually give the same price in Montreal.

Q.—In selling granulated honey in tins, do you put in 10 lbs. of honey, or do you make it weigh 10 lbs.?

A.—I tell my customers the tin is calculated in the weight. I give good weight, but they all understand that they are getting gross weight. I never try to make them believe it is net weight, but I always give two or three ounces over. They are always to understand it is gross weight.

Mr. HOLTERMANN: That is a point of great importance to our market, and there is a great deal of misunderstanding among those who buy cans or packages as to whether they get gross or net weight. I feel very strong on the subject, because in business it comes up time and again. I believe that the majority of people think they are getting 10 lbs. net. The honey goes to the wholesale trade, and is by them retailed, and in nine cases out of ten no explanation is given. I think it should become law that it should be marked on the package.

Mr. McEVoy: I agree with Mr. Holtermann, they should give 10 lbs. in the tin.

Mr. TIMBERS: When I first started retailing my honey I wanted to put it in the same pails as those used by the wholesalers, but found that no more of these pails were in use, so I had to use the other pails; but I tell my customers it is gross weight and they are not deceived.

Mr. PETTIT: I think the wholesaler should mark them gross weight.

Mr. HOLTERMANN: I think this Association should put on record that it be advisable that where gross weight is sold it should be marked distinctly on the package.

Mr. BROWN: I think that gross weight should be marked on the cans. I second that motion of Mr. Holtermann.

Mr. LAING: I would like to ask Mr. Holtermann if it would be better if he made that motion in a different form—that we as an Association recommend that all beekeepers use gross weight instead of net weight.

Mr. DEADMAN: I would like to see Mr. Holtermann's motion accepted. It is very confusing that some of the pails are gross, and some net, and I have always to explain to my customers that my pails hold more. I think it ought to be compulsory that the pails be labelled gross or net, in small type.

Mr. DICKINSON: I recommend the pail be marked 10 lb. net.

Mr. HOLTERMANN: This is the first step this Association has taken in this matter at all, and it is perhaps a comparatively easy step; we can probably at a future time go further. I am in favor of legislation in the matter as in adulteration, but perhaps if we go beyond a certain point we may have difficulties.

Mr. DICKINSON: I think it is necessary for us to give value for the money we get; and the only way to do it is to give weight. We must certainly make allowance for our packing. If I am shipping to England, I put down as expenses my tins and my crate, but I put in every time the full weight. If that was made compulsory, I think it would be better for the

Association and for the beekeepers of Ontario, and give us the name we deserve.

Mr. HERSHISER: I think in selling honey gross you have to take less for your honey, in selling in large bulk you must sell net weight. You cannot say one barrel will weigh 40 and another 60; there would be no way of getting at the value of the tins. We do not pay the price of butter to the tub when we buy a lb. of butter.

Mr. TIMBERS: Is this Association going to compel its members or recommend them to sell their honey at net weight, when all other things that honey has to compete against are put up in gross weight? All marmalades, jams, preserves, etc., are sold throughout the country gross. Is honey to be the only one sold net?

Mr. DICKINSON: I do not think they sell by weight in jams.

Mr. TIMBERS: Decidedly, anywhere in Toronto.

Mr. LAING: Referring to Mr. Dickinson's remark about people getting value for their money, we buy a pail and pay perhaps 7c., or 8c., 10c. if you like, anywhere along there, and we sell that pail when we weigh it in at identically the same figures we pay for it. Haven't we given the people value for their money?

Mr. PETTIT: Certainly.

Mr. KIRBY: I give people a better bargain in giving them gross weight than by giving them net, and I have much pleasure in seconding Mr. Holtermann's motion.

Mr. HOLTERMANN: I think you understand this resolution goes thus far. It does not compel you to sell gross or net weight; it leaves that open to every individual. But when you sell gross weight; that package must be marked "Gross," and when you sell net it must be marked "Net" in plain figures.

The resolution, as passed, read: "That this Association place itself on record that it is desirable where honey is sold either wholesale or retail, and gross weight is given, that the gross weight shall be distinctly and plainly marked upon the package."

Q.—Would it be advisable to build a covered delivery wagon for retailing honey with name and other information printed on the outside?

A.—I do not hardly think it would be advisable. You would need to have just the right man for that rig to make it pay, and we beekeepers are most of us in the business for what money we can make out of it, and I do not think that would be a paying investment.

Q.—When the consumer pays 10c. per lb. for honey, how much should the retailer pay out and how much the wholesaler?

A.—That would all depend on how many hands it would have to go through. All I ever knew wanted 20 per cent., and some of them wanted 30 per cent. If the big man is going to buy it in bulk and he gets 20 per cent., or 30 per cent., the store-keeper also gets 20 per cent. or 30 per cent. How much is the producer to get out of it? I think the wholesale man should be allowed 20 per cent., and then he and the middleman must make the bargains as they like.

Mr. HERSHISER: The best way is for the producer to sell as high as he can, and let the rest do the best they can.



## SPRING MANAGEMENT.

BY JAMES STORER, LINDSAY.

In the absence of the author, through illness, Mr. Byer read the following paper:

Spring management is a very important part of beekeeping and depends so much on fall management that you will not object, I hope, to a few remarks on that subject. Every hive should have a good queen, and not less than 40 lbs. of good honey. When put in winter quarters, and if properly protected during the long winter, spring feeding will not be necessary. Feeding in spring is a disagreeable job for the beekeeper, and you cannot fuss around a hive at any time of the year without annoying the bees, but more especially at this season.

Suppose a beekeeper has about 100 colonies, part of which have been wintered on their summer stands, and the balance in a good cellar. If proper protection and ventilation have been provided for the hives left outdoors, there is no need to touch them till we are getting nice days in April. About that time those wintered in the cellar may be taken out, but a great deal depends on the season, some seasons being much later than others. A good time for removal from the cellar, if the bees can be kept quiet, is when the first pollen is coming in; then choose a fine day. The writer has not tried the Alexander plan, and finds no difficulty with bees mixing. Of course, one must be careful not to put too many hives in one place at the start. Put a few in one corner of the yard, then the opposite corner, and so on until all are placed. Then take four or five sheets of newspaper, previously saved for this purpose, and cover the tops of the hives, taking care that no heat can escape. When the bees are done flying for the day, close all the entrances as close as possible, this to keep the cold wind and robbers out. If the hives on the summer stands have not had papers put under the cushions it should be done now.

In the average season this work should be finished from the 12th of April to about the 20th. Then we may expect the first fruit bloom about the same dates in May, and, knowing the bees have plenty of stores, it is a good plan to leave them alone, except to look out for robbing on a day when the weather is suitable for the job. About the time the first flowers come out, a start should be made to examine the hives, clip the queens, spread or reverse the brood frames, and break a portion of the cappings on the honey, making the bees think they are in clover. When this is being done, the beekeeper should have a book, and note the condition of every hive, as a record of this kind saves lots of unnecessary opening of hives. When we get to No. 100 we will probably find 80 per cent. will be ready for the honey season, 15 per cent. a little light, and some dead queens. The dead ones have been found before the examination, or should have been. The 80 should be watched closely, making sure that there is always enough of unsealed honey in the hive, and that the queen has lots of room for breeding. A good plan to treat the 15 that are light is to select say seven or eight of the best of them, according to their strength, take out all the empty frames. Then go to the lighter ones and take out brood frames and bees and fill out the seven or eight, making sure that you leave the queens in their own hives. The few that are left light can be used to shake swarms on, or anything else the beekeeper can do with them to the best advantage.

We will suppose this work is finished on, say May 20th. In less than a month the clover season will be on, and on the care given the bees for the next few weeks largely depends the amount of surplus the beekeeper will get for his work. Some seasons the bees may fill the hives so full of honey in a few days that the queen is crowded out; then another season the bees will be confined in their hives most of the time and run short of stores, and the queen will stop laying to avoid either extreme; so the beekeeper must be on hand every day to know what is going on and apply the remedy.

### QUESTION DRAWER.

Mr. R. H. Smith, St. Thomas, answered the questions propounded:

Q.—Is it best to give, say 40 lbs., feed in the fall, or, say 25 lbs., and then feed the balance in the spring?

A.—I should say it would be safer to feed the 40 lbs. in the fall; you might have unfavorable weather in the spring.

Mr. HERSHISER: I would like to ask if it would not be an advantage to give the difference between the 25 and 40 in the spring?

A.—I do not think it would be sufficient to have only 25 lbs. in the hive in the fall of the year. I should advise giving the whole of the store in the fall.

Mr. LAING: What would you consider would be sufficient?

Mr. SMITH: Not less than 35 lbs.

Mr. LAING: Outside or inside?

Mr. SMITH: Either. I do not think bees consume a great deal between the time we feed them in the spring and the time they go into winter quarters.

Mr. DICKINSON: I think more than 30 lbs. is needed for inside wintering. Do you not think there should be a difference between inside and outside?

Mr. SMITH: Yes, if you have a good cellar; but occasionally you come across stocks of bees that consume an exceptional amount of stores. It is surprising. If bees are strong and in good condition and have a good queen, the amount of stores, one season with another, they will consume.

Mr. DEADMAN: I decidedly object to giving them 40 lbs. in the fall.

Mr. HERSHISER: I find bees consume from 7 to 8 lbs. during the four months they are in the cellar. The most I have had consumed by a colony was 11 or 11½ lbs., and the least 4½ to 5 lbs. Of course these estimates are not entirely correct, because no account was taken; but I believe the experiment was sufficiently correct to warrant stating that 20 lbs. is sufficient for winter stores; and if 20 to 25 lbs. were given, it was enough to last them until the apple blossom came. I would ask what kind of food to give and how to prepare it, that is, how to prepare ordinary candied food. You Canadian beekeepers know how to prepare the candy to carry a strong colony through without loss.

Mr. McEVOY: Take a piece of cheese cloth and place it over the frames. Fill two quart jars with warm sugar syrup and stand upside down over the cheesecloth. Put on an empty super, and pack in around snug and warm, and they will take down 20 lbs. in one night. I generally try to get combs of honey from those who have more than they require. If I had to feed early in the spring, and there was a likelihood of more cool weather, I would make the food comparatively thick; otherwise somewhat thinner.



Q.—Give your opinion of the Alexander method of building up colonies, placing the weak ones over the strong.

A.—I am not an advocate of it. I look upon it as being a good deal upon the principle of robbing Peter to pay Paul.

Mr. KIRBY: Last spring I tried the experiment, and found it worked admirably. I had good working colonies as a result, and must say I am well satisfied with the plan.

Mr. ADAMS: What strength were the weak colonies, were they the size of a silver dollar or what size? How strong were they?

Mr. KIRBY: About the size of my hand. The bees from below would go up through and would help to add to the working conditions of the colony, and give the queen every chance to lay; and in that way the bees would build up rapidly, and in about four weeks I took them down and the hives were full of brood.

Mr. McEVOY: What time did you put the brood up?

Mr. KIRBY: In May I think.

Mr. HERSHISER: Alexander says it is to be done three or four days after they are taken from the cellar.

Mr. KIRBY: I had not the time to attend to them when they should have been attended to.

Mr. HERSHISER: I believe the success of this plan depends upon conditions a good deal, and if it were not for the fact that I consider Mr. Alexander a good beekeeper I might be inclined to doubt the wisdom of his plan. I tried it with some colonies last spring, and failed with about half of them; I attributed the failure to the fact that bees built very slowly last spring, and it was not a fair season in which to try an experiment.

Mr. HOLTERMANN: If a strong colony had an inferior queen, the bees would be able to take care of more brood than she could produce, then it would be an advantage, but virtually I don't see any advantage.

Q.—What is the least number of spaces or combs occupied by bees, where you would consider it advisable to unite?

A.—I may say I am not in favor of uniting to any great extent, and it is a thing which I do not practice. Supposing the bees occupy say four spaces, that is a weak stock. By spreading the combs, and allowing more bees to occupy more space, they are able to keep the brood warm, and do more brood-rearing than when so closely interspaced. Often in a natural spacing where they cap two spaces they cannot brood-rear at all; they cannot keep the brood sufficiently warm. But where there are only two or three spaces it is better to space more widely and keep the bees warm.

Mr. HERSHISER: Some of our beekeepers advocate close spacing and say the bees will take more care of the brood and rear more when closely spaced. I believe in close spacing.

Mr. McEVOY: I agree with Mr. Hershiser.

Mr. HOLTERMANN: I am in favor of wider spacing. It is only very weak stock than can be made to rear more brood by the closer spacing.

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## DIRECTORS' REPORT.

The following Report was then read by Mr. Miller, London:

Your Directors for the year 1906 beg leave to report as follows:—The year just closing has been a peculiar one in many respects for the beekeepers of the Province. Bees came through the winter in good condition, and have done well through fruit bloom and were generally very strong for clover and

basswood. The result, however, has shown that in only a few favored localities there was about one half a crop secured, while the great majority experienced the sickening disappointment of baffled hope. The sum of \$200 was set apart for the affiliated societies. This has been expended in accordance with the by-laws. The sum of \$150 was received from the Executive of the Fruit, Flower, and Honey Show. This, together with the rebate of \$50, which was the amount of our grant to the Fruit, Flower, and Honey Show, makes a total of \$200 received from that Association.

The Executive of the Ontario Beekeepers' Association thought it desirable and best for the Association to make a collective exhibit instead of individual exhibiting as formerly, and to have a demonstrator distributing literature and explaining the uses of honey. Several thousand copies of the booklet "Food Value of Honey" have been distributed in this manner.

The *Canadian Bee Journal* has been given to the members of the Association during the year.

Copies of the law regarding spraying of fruit trees were mailed to members as recommended.

Your Directors appreciate and approve of the suggestions received from the Department of Agriculture to appoint six Foul Brood Inspectors, and to have the Secretary in the Department of Agriculture.

Your Directors recommend certain changes in By-laws to conform with the act respecting Agricultural Societies.

The Treasurer's report, which will be read in your hearing, will, we trust, show our finances in a satisfactory condition. All of which is respectfully submitted.

(Sgd.) F. J. MILLER,  
WM. COUSE.  
M. B. HOLMES.

The proposed changes in the By-laws, as suggested by the Board of Directors, were then read, and, on motion of Mr. McEvoy, seconded by Mr. Craig, were adopted.

#### FINANCIAL STATEMENT.

For the year ending November 8th, 1906.

<i>Receipts.</i>		<i>Expenditure.</i>	
	\$ c.		\$ c.
Balance from last report.....	107 08	Grants to fairs, etc.....	200 30
Members' fees.....	159 00	Prizes Fruit, Flower and Honey Show.....	177 00
Legislative grant.....	500 00	Officers' salaries.....	75 00
Affiliated Societies.....	55 00	Directors' fees and expenses.....	116 30
Legislative grant to Fruit, Flower and Honey Show.....	150 00	Postage and stationery.....	38 95
Miscellaneous.....	12 00	Printing.....	20 60
		Judges' expenses.....	9 00
		Periodicals for members.....	103 35
		Reporting.....	50 00
		Expenses of committees.....	63 70
		Caretakers at Fruit, Flower and Honey Show.....	15 00
		Auditors.....	4 00
		Balance on hand.....	110 18
Total.....	983 08	Total.....	983 08

Mr. ARMSTRONG moved, seconded by Mr. LAING, that this Report be adopted. Carried.



## AFFILIATED SOCIETIES FOR 1906.

<i>Name of Society</i>	<i>Secretary.</i>	<i>Address.</i>
Glengarry .....	J. A. Munroe.....	Munroe's Mills.
Middlesex .....	E. L. Bainard.....	Lambeth.
Simcoe .....	D. Nolan .....	Newton Robinson.
Oxford .....	John Newton .....	Thamesford.
Norfolk .....	R. B. Emrick .....	Tyrrell.
Brant .....	W. J. Craig .....	Brantford.
Russell .....	G. G. Sherriff .....	Clarence.
Halton .....	Geo. E. Saunders.....	Hornby.
York .....	J. L. Byer .....	Markham.
Victoria .....	A. H. Noble.....	Cresswell.
Haldimand .....	Wm. Atkinson.....	Cheapside.

## REPORTS OF THE TRANSPORTATION AND HONEY EXCHANGE COMMITTEES.

Mr. HOLTERMANN spoke as follows:—I think you are all aware of the work and object of the Transportation Committee. The committee, consisting of Mr. Couse, Mr. Evans, and myself, met the Railway Commission in Toronto and presented our case. We took a very great interest in it, and worked it up thoroughly. When we had got through, a number of those present came up to us and congratulated us on the way we had presented our case. We certainly did the best we could, and later on we received a report from the Railway Commission. We did not get as much as we would have liked to have got, or thought we should have had. Dr. Mills did not agree with the other two Commissioners in their decision, but thought we should have had extracted honey at as low a rate as syrup. However, we did get some concessions. Beeswax has been first class, and nearly all of you ship beeswax. That was changed to 4th class, which makes a very great difference, and 2nd class in car lots. There was another clause put in, that is, honey in pails with wooden crates. These were 2nd and 4th class, also including bees in hives. The car minimum is now to be 12,000 instead of 20,000 as formerly.

These are the concessions we received from the Railway Co.

R. H. SMITH: That concession of beeswax alone is worth a great deal to bee-keepers of this Province. I know from shipping beeswax in the past, it has been first-class, and bees comb third-class.

Mr. DICKINSON: I move the adoption of the report and also a vote of thanks to the Transportation Committee for the manner in which they have brought about this reduction. Carried unanimously.

Mr. EVANS: The railway men are not able to give reasons as to why the present rates prevail.

Mr. SMITH: We ought to get honey properly rated by the Express Companies.

The following report of the Honey Exchange was sent out on Aug. 7th:

The Committee met in Toronto on Aug. 4th to consider the probable prices that may be obtained for honey.

Each member of the Ontario Bee-keepers' Association was mailed a circular asking them to report the amount of honey they had or would probably have at this date. We regret to say that only about half have taken enough interest to reply. If all had replied the Committee would have been

in a better position to make a report. However, the reports received have come from all parts of the Province, and from no points are the reports good. A few are fair but the majority poor, and we estimate the crop this year to be only from 20 to 25 per cent. of last year. A few have reported from 50 to 60 lbs. per colony, the majority from 20 to 25 and a few nothing.

The fruit crop is reported from fair to good, but prices for the same have been good so far.

As to the price of honey the committee consider that honey should command a good price, at least 10c. wholesale for No. 1 Extracted Honey, and darker grades from 7c. to 9c. Where honey is sold direct to the retail grocer we think 11c. should be obtained in small packages suitable for their trade.

Comb honey is almost a failure and choice No. 1 should bring from \$2.00 to \$2.50 per dozen.

No. 2 should bring \$1.50 to \$2.00 per doz., and darker grades from \$1.25 to \$1.50.

The retail should be 12½c. We find that the old honey has all been consumed and that the markets have not been as bare for many years.

Mr. CRAIG: What the Committee wants to know is not the exact amount, but what you expect, so as to be able to estimate at some figure at least as to what the results are and to judge accordingly.

Moved by Mr. LAING and seconded by Mr. DEADMAN that the Report of the Honey Exchange Committee be adopted. Carried.

## REPORT OF TORONTO EXHIBITION REPRESENTATIVE.

Mr. GRAINGER, the representative to Toronto Exhibition, then delivered the following address:

I have had a good deal of pleasure in attending the meetings of the Agricultural Industries Committee of the Toronto Exhibition. So anxious were the Directors to have our views in connection with the new building that they invited me to come and express my views as to what the bee-keepers would like.

I may emphasize what I said last year about the lack of interest on the part of bee-keepers in the Exhibition. We get more advantages out of the Exhibition than we think. It is not only those who go there with a commercial idea in view that derive benefit. The information given to the public year after year is so great that people are getting to know more about honey in Toronto, and when you consider the numerous questions that are answered, there must be more people better informed as to honey and bee-keeping that we are aware of. In order to show you that it is more thought of than you would imagine, I will relate what I overheard: A little boy came along and said to another fellow, "How do you find the Queen?" whereupon the other promptly answered, "Look for the one with the crown on."

We answer many questions, and distribute a lot of information for the benefit of the bee-keepers.

Some changes are made in the prize list every year. I sent out cards to all contributors, and asked them to state what they thought would be good in the way of a change. Only about half were returned to me. These stated what would be good changes to make, and several sections were cut out this year; but I put in something else to take their place and we got our money. The most interesting thing to bee-keepers, that is to those who are going to



show, is the plan of the new buildings. I brought a very rough plan with me. We thought after the fire that the money voted for the Horticultural building might be used in another way. The money will be expended, however, on the new Horticultural building, the site to be where the old Transportation building was; it is the best place on the grounds and will be the finest building there, and we may therefore expect next year to have one of the finest shows. The light will come in in such a way as to show the honey to the best advantage, and it is proposed to put counters of maple, and have it so fixed that everything will be perfectly clean. The floor being of cement and washed and kept clean, the dust and dirt and sticky mess will likely be done away with. The building must be kept perfectly clean and respectable all the time. (Mr. Granger then described the small plan brought with him). I think that with a building like this, and a good show of honey, we ought to do ourselves credit. I do not know that I have anything else to say on the matter unless it be a recommendation that the bee-keepers, those who are interested, will send any suggestions as to anything new and better for a change. We will have a new building and a better equipment, and the Association will be glad to receive suggestions especially if they are on a new line.

Mr. SMITH: As an exhibitor at the Exhibition we have found there is not enough interest taken as there might be; probably in many cases it might be very profitable. The interest shown has created a market in Toronto. From the time that I can remember to the present time, every grocer must keep a supply of honey, far more so than in a country town. It might be very much extended, as Mr. Grainger says, if those interested would send us suggestions; we want new ideas to make more attractive exhibits, and the sooner we get out of the old ruts the better.

On motion of Mr. LAING, seconded by Mr. SMITH, this report was adopted.

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### NEXT PLACE OF MEETING.

It was considered when and where the next meeting should be held. Moved by Mr. LOWEY, and seconded by Mr. HOLTERMANN, that the next meeting be held in the city of Toronto, the time of meeting to be left to the Executive Committee.

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### HONEY SHOW COMMITTEE.

It was decided that the appointment of the Honey Show Committee be left in the hands of the Directors when they were elected.

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### FALL MANAGEMENT.

BY DENIS, NOLAN, NEWTON ROBINSON.

Fall management consists in preparing our bees for winter, for spring, for next season, and, in many ways, it is laying the foundation for future success.

The work of the fall season may be lessened to a great extent by the system of managing during the summer season. About the middle of September make an examination of each colony, find out its condition in regard to its strength of bees and quantity of stores, as well as to whether it has a good laying queen and is in a healthy condition.

If sufficient bees to cover five Langstroth frames are found, it will be safe to put such colonies into winter quarters; if less than this amount of bees it will be better to unite with another weak one and have a good colony.

To do this, remove about half of the lightest combs from colonies to be united, and some times afterwards on a cool evening, put two weak ones together by placing the combs of one with adhering bees alternately between the combs of another. Remove the queen if one is inferior to the other, otherwise the bees settle it amongst themselves. Be careful not to get colonies too strong in this way, as they do not, as a rule, winter as well as medium ones.

All colonies going into winter quarters should have a laying queen, and colonies that have been queenless a short time may be given a laying queen by some safe plan of introduction.

If the colony has been queenless since the swarming season, it will be useless to spend time and feed on them, as the bees are too old and will die during the winter.

The most important part of this season's work is to provide each colony with sufficient good stores to carry them through until they gather feed next season. If we could supply them with about 25 lbs. of good clover honey well ripened and capped, there would be little danger of winter losses.

We must have some reliable way of determining the amount of honey each colony contains as found when we are doing this work. Some good bee-keepers weigh their colonies on scales, allowing so much for the hive, combs, etc., but I consider it unreliable, as there may be a difference of 10 lbs. in the make up of different colonies; a difference of material of the hive, amount of brood, pollen, etc., in the combs.

I consider an examination of the combs the best way of weighing stores, and if honey to the amount of five or six Langstroth frames is found it will be sufficient. A colony with less than this amount should be given well-capped combs to make up the shortage, removing empty combs, and crowding the bees out a few combs, as the food supply and quantity of bees will allow putting in a division board or dummies. This keeps the cluster more compact, and in a body during cold snaps in winter.

If colonies are short and combs of honey are not at hand, liquid feed may be given after first contracting the space for storing as in the other case.

As a rule pure sugar syrup is fed, made from the best granulated sugar; it may be given in any kind of feeder if fed early in the season.

A handy feeder one inch smaller than the inside of the super may be made to go into an extracting super. It may be constructed of undressed lumber waxed at the corners and made of different depths to hold just enough for my colonies, with a few small strips or blocks of wood for floats. Place the feeder upon the tops of the frame, and if the weather is cool feed the syrup warm, contract the entrance, and feed during the middle of the day.

The syrup, I think, gives best results when made of a consistency of three parts of sugar to two of water. Sometimes a little honey is added to prevent granulating, but I never practise it. Our syrup is made with steam, and it gives good satisfaction.



A half inch steam pipe is run down into a barrel or honey storing tank. Put 2½ pails of sugar and one of water until the tank is nearly full, then turn on the steam which will warm the water and agitate the sugar. With a little stirring the sugar is soon dissolved, and the syrup can be drawn off at the bottom.

In conclusion, I wish to state that what I have just given you on this question is solely for the preparation of bees for out-door wintering. Not having any experience in wintering otherwise, I cannot say that it would answer for preparation for indoor wintering.

MR. BEAUPRE: How late in the fall would you unite?

MR. McEVOY: Mr. Nolan speaks about feeding the colony in the middle of September; I think he is about a month too late.

THE PRESIDENT: I think so, too.

MR. McEVOY: I like plenty of bees for outside wintering; he seems to think we can have too many. He says 25 lbs. of stores are sufficient, but I consider that amount too limited, and would rather have more. I think 25 lbs. not enough.

THE PRESIDENT: 35 lbs?

MR. McEVOY: I would rather. As to the feed, Mr. Nolan says three parts sugar to two of water; I prefer the proportions two to one.

MR. NOLAN: I said that a good deal of this work could be done earlier in the season. I did not say we should leave our colonies queenless, but I said that if we found in September that they had been queenless a short time we should by some plan of introduction give them a good laying queen.

THE PRESIDENT: Do you propose doubling a colony if you found one queenless?

MR. NOLAN: I think if we found a colony that had lost a queen one could be given them.

MR. HOLTERMANN: I think Mr. Nolan will require to change his paper a little; a word or two will be sufficient. I noticed the objection Mr. McEvoY raised. The paper gave me the impression that you were to see they were good laying queens. That was too late to know whether they were good laying queens or simply queens.

MR. NOLAN: I did not mean to say that we were looking for a queenless colony at that time.

MR. LAING: As to Mr. Nolan's way of feeding, to those who have steam pipes it is all right if they desire to use them. I have used cold water for years. It is a very easy matter to dissolve three pails of sugar in two pails of water.

MR. PETTIT: Before we leave this matter, I would ask Mr. Nolan how he knows a hive is queenless in September?

MR. NOLAN: In 19 cases out of 20 you can tell by the appearance of the combs and by the appearance of the bees.

MR. HERSHISER: My bees breed a good deal longer than the middle of September. I find brood until the middle of October. I presume it is owing to the locality; if there was nothing for them to gather they would not be breeding up to that time. It would be unsafe for me to look over the colonies to see how many stores were left until they have left off breeding. As to the feed, if I find they diminish, I feed them well, and give them a syrup as thick as they can very well take; the food I give them is 5 lbs. sugar to 2 lbs. water; you may find that too much sugar perhaps. I mix it with hot water, too, and all things considered it will perhaps be better to make the proportions five to three instead of five to two. As to the amount of stores, I think a person will need to be pretty accurate, and examine each

comb separately. I weigh the colonies, and know how much a 10 inch frame should weigh; it weighs 25 lbs. By weighing a colony I can tell how much stores it has. Then I go to work and weigh a lot of brood combs that are empty, and I make plenty of allowance for old combs. You will find they run about a pound.

Mr. PETTIT: Is that the regular Langstroth comb?

Mr. HERSHISER: Yes, they will average a pound each. I do not allow anything for bees.

Mr. TIMBERS: Might not a bee-keeper be deceived sometimes? The cells might be half full of pollen; there ought to be some method of ascertaining whether the combs contain more pollen or more honey.

Mr. HOLTERMANN: If a man is going to feed his bees, he should examine them first. You are not likely to find combs so clogged with pollen unless the queen has been absent.

Mr. TIMBERS: I mean in the stores gathered by the bees themselves.

Mr. McEVOY: It does not matter if there is a good deal of pollen. The bees consume the honey until they strike that pollen; you should feed to cover that pollen, and feed plenty.

Mr. TIMBERS: Will that amount of pollen answer the same purpose during the winter as the same amount of honey?

Mr. McEVOY: No, but if you feed plenty of stores it doesn't matter if there is quite a bit of pollen.

Mr. HOLTERMANN: You are afraid of giving the bees too little rather than too much.

Mr. NEWTON: Speaking about lifting and examining the hives to tell what they weigh, I think there would be lots of trouble among our younger bee-keepers if this were adopted. I think the most satisfactory plan is to weigh the hive, and then to allow so much for the hive; I calculate 23 to 25 lbs. for my hives. If mine weigh 52 to 55 lbs. I feel satisfied that colony will go through, that is in the brood rearing season.

The PRESIDENT: That is good advice. When I first started beekeeping, I could not by feeling the hive tell how much it would weigh, but I got to be a pretty good guesser as to how much a hive would weigh, and for two or three years I have hardly used the scales. Sometimes I test to see if I am correct.

Mr. HERSHISER: It depends a good deal on what time of day you weigh; in the evening they are heavy and in the day they are light.

Mr. ROACH: Suppose you do away with this weighing and feed them as much as possible, would you have too much?

Mr. McEVOY: Yes.

Mr. HOLTERMANN: With reference to feed, I think 2 lbs. of sugar to 1 lb. of boiling water makes the best food. In the matter of weighing, I agree with the President, if you are used to it, but I think if you are not, it is better to use the scales.

Mr. DEADMAN: The strength of the syrup depends on the time of year you feed; if early in the season use more water. I like to feed with warm syrup, especially if the weather is cool.

Mr. WHITSIDE: There seems a difference between feeding and the bees putting it in themselves. In 1899, for instance, at one yard they got a surplus of about 1,200 lbs., and I took this surplus and fed the other young bees with it, and brought them up to the same standard. About the next June I came round to this same yard again, and found it was all right; there was hardly one starving bee in it, but the other yards had about 150 starved



to death. There were about 80 colonies in the yard where they had the surplus; the other yards averaged about 50.

Mr. McEVOY: When did you feed them?

Mr. WHITSIDE: When I had time.

Mr. McEVOY: But about what period?

Mr. WHITSIDE: About the middle of September.

Mr. McEVOY: Then you started brood rearing?

Mr. WHITSIDE: It is one thing for the colony to have plenty themselves and another thing to feed. It makes quite a difference. All that summer they were at starving point; when they got the feed they could eat three meals a day.

Mr. BROWN: It is a general thing throughout the whole Association to feed with sugar syrup. Why not feed honey, their natural food? When I find colonies of bees short of stores, I take out the empty comb and replace it with honey. I don't care whether it is warm or cold water, it is not good food for bees.

Mr. COUSE: Mr. Brown speaks of feeding back honey. I have had dark honey which I intended to sell, and I fed the bees back with it instead. It granulated and the bees starved with abundance of honey.

Mr. BROWN: Had it been extracted out of the comb?

Mr. COUSE: Yes, I am telling you what I did with honey feeding it back; but I find it granulates.

Mr. GRAINGER: I have practised Mr. Brown's plan, saving the dark honey for the purpose. I have always been successful in putting back those combs; they are sealed and are just the finest food for a colony that is weak.

Mr. SWITZER: I have seen no sign of granulation. I have had my bees three or four winters now, and feed them back honey and they have been all right. I wonder at you having this trouble with the granulated honey.

Mr. COUSE: How do you weigh your bees?

Mr. SWITZER: I form a sort of string balance, and the bees never know they are being weighed. Hardly a bee will come out of the hive.

The PRESIDENT: Mr. Switzer feeds his bees with honey that never granulated and Mr. Couse feeds honey that has been granulated.

Mr. HOLTERMANN: There is a great difference in honey; some is more apt to granulate than others. This report is going out to the country, and I for one think that it is well just to say a word of warning in the direction of feeding back honey. I know apiaries that have been so badly diseased by feeding back honey, when unknown to the one who did it, that I think it is advisable if feeding back is to be done to feed back with sugar syrup; and while I see the objection to throwing lots of honey on the market, it is sentiment rather than a practical thing. I think it is better to feed back with syrup rather than honey.

Mr. BAILLIE: One question I would like to ask Mr. Nolan. Referring to feeding back, he said "in September." If a person neglected it and left it till a month later, what would be the consequence?

Mr. NOLAN: I do not think it would be advisable to feed so late as the middle of October. It would not be a very easy matter to get them to take it then, as the nights would be too cool. I think when you feed the syrup in the last part of September or early in October the bees ripen it, and the combs become white. In regard to feeding combs of honey, I would rather feed good clover honey in combs if I had them, but we get the clover honey in our extracting combs. So far as feeding extracted honey is concerned, the bees did not winter well on it, and we had great losses. I think it is necessary sometimes to feed the syrup warm, but it takes a lot of stirring to make the syrup with cold water. As regards the weight of the

hives, I do not put any particular weight on them; it is about as fair to say what a hive in the general terms should weigh as what a good bee-keeper should weigh. There is a great difference in the size of hives, and it would hardly be safe to say what weight you should put on, it might be too high or too low. We should not give the bees too much feed, though many bee-keepers think they will not winter well without much feed.

Mr. TIMBERS: Can bees ripen syrup or honey if it is too late to cap it over?

Mr. NOLAN: I think they would ripen it later than they would cap it. I think perhaps if syrup is well ripened it is as good as if it were capped.

Mr. GROSJEAN: I had one very light colony. There was not more than three or four lbs. of honey in the hive when I took them into the cellar. It was very full of bees and I did not like to disturb them in the cellar. I could not find any frame that was not covered with bees, so I took them and fed them about 15 lbs. of one-third honey, one-third water and one-third sugar. It was buckwheat honey. I made it warm, and took it down the cellar and fed them. I looked at them a day or so afterwards and they were quiet, then I made up my mind that should do them till the spring. But I found I had to give them more later on, and they were the best hive I ever had. I got 40 to 50 lbs. more honey from them than from any other hive.

Mr. LAING: Mr. Nolan touched on one point; he said that the colony must not be too strong, that a colony in normal condition, one which is generally strong, not too weak, will winter better than a really powerful one. I would like to have your opinion on this.

Mr. NOLAN: That is in reference to colonies united.

Mr. ROACH: Three years ago I had an exceedingly strong colony. I was much disturbed about it; it was wintering outside till about Christmas. I left them alone, and in the spring they were starving. That is an over-strong colony.

Mr. HERSHISER: The question has been raised as to ripening stores. I want to know what is meant by the ripening of stores. I understand that if stores are ripened they will be capped over. If it is not capped, will it not do just as well?

Mr. McEVOY: Not quite.

Mr. BRUNNE: Speaking of feeding, I never lose any more through feeding in the winter. If I winter in the cellar I can feed the bees at any time with success. I use half water and half best granulated sugar. I find that it answers better than honey, and it is also far cheaper, and for that reason I get more money in my pocket. So far as feeding up is concerned, I feed up by the 1st of October. If you have a house cellar, put them in it, but have them lifted a little so that you can get to them more easily. I said half water and half sugar, but I think it is better to have it a little strong, so that better proportions are three parts sugar and two water, and you can feed them in the cellar any time at all.

Mr. EVANS: There are different cellars. Some will not do to put bees in with uncapped honey, and some will. I like to feed the bees as late as they will take it. If I feed them early and again late in the fall it is all turned into bees, and the hives are short again. I use the old Canadian feeder made by Jones, which I think is the best feeder made in the world. You can cover it well up and keep the heat in, and it keeps the bees all right until the spring. I would rather have my bees in the cellar than anywhere else.

Mr. TAYLOR: A neighbor of mine had 25 colonies two years ago, and kept them in his cellar, in one corner of which there is a spring of water. He had



8-inch frame hives, and he left them the whole winter without a cover on; that is, he just pulled back the covers they had on, giving them granulated sugar syrup. In this way they went the whole winter with nothing else, and were the finest bees I ever saw.

### INTRODUCING QUEENS.

Mr. McEvoy was asked to answer the questions propounded:

Q.—Should tobacco be used in the introduction of queens?

A.—No, we do not want to use tobacco at all.

Q.—Would you remove the attendant bees from a cage of a queen purchased from a breeder?

A.—I am not particular about that; but I would never introduce with a cage. If you introduce a queen with a cage and allow her to eat out, some bees would get away from her. I have known bees not to accept her for ten days; they would chase around her and have nothing to do with her; they might possibly kill her, but if you watch closely you need not lose any queens.

Q.—Is it advisable to place the cage containing the new queen in the hive prior to taking out the old one?

A.—If I am not too busy I would; if so, I would leave it. If you wish to introduce an imported queen, I will tell you a plan. You take the brood and put it over the hive and get it capped, then take a fine screen and place it over them, and then let the queen loose. None of them will hurt that queen, that is a safe plan.

Mr. HOLTERMANN: I have paid out at least \$200 the last few years in buying queens and introducing them, and Mr. McEvoy's method is all right, only it entails a great deal of work. I can introduce queens as safely as any way I know of by means of the cage.

Mr. TIMBERS: I have introduced queens, and I always like to take the queen out of the cage she came in and the bees too. I believe that nine times out of ten it is the bees that come with the queen that cause the queen to be killed. As to putting the new queen in before the old is removed, I never tried it but once, and it satisfied me that it was not a successful plan; I believe in removing the old queen before you put in the new one.

The PRESIDENT: You must have candy and feed accessible, as if you put a caged queen without feed at all into an ordinary colony she will starve. She must have her own feed supplied.

Mr. EVANS: Won't a queen feed herself?

The PRESIDENT: If she has a chance, she will.

Mr. ARMSTRONG: I introduce the new queen and remove the old one at the same operation. As soon as I receive the queen I take her out of the cage she came in and put her in the prepared cage. Then I take a few young bees out of the colony she is to go into, halve the combs, and put in with the queen and place them on the combs and close the hive, and I found that everything went well.

Mr. NEWTON: I agree with Mr. Timbers that it is the bees that come with the queen that do the mischief. I think it is more the bees' fault than that of the queen. I find it most successful to remove the queen out of the cage in which she came, shake the comb with the brood about ready to hatch, and with the young bees emerging from the cell and some loose honey. Then I take a piece of netting four or five inches square, let the queen

run on the board and cover her with the netting. I never lose a queen by introducing her in that way.

Q.—Would you advise introducing virgins in the supers over excluders for superseding, than to remove excluders?

A.—No.

Q.—What is the best time, spring or fall, to introduce a queen?

A.—Either, but I would rather introduce that queen in autumn. I would not want to waste the fall. If it was necessary, then in the spring. This will have to be regulated according to circumstances.

Q.—How would you introduce a virgin queen?

A.—The same way as with the other, by caging. If it is a virgin queen, she should not be left more than two days caged, she must be allowed to fly out.

Q.—Have southern queens any advantage over northern reared ones?

A.—I do not think it makes any difference so far as that is concerned.

Q.—Will a queen taken from a foul brood colony carry the disease to another hive?

A.—No, never.

Q.—Can a queen be successfully introduced in a super by shutting the bees off from the brood chamber for forty-eight hours and then remove the super?

A.—I do not understand.

MR. CHRYSLER: By introducing a queen in a super, that is, a queen just removed from below, if she is introduced up there a day or two, and the queen excluder is removed, would she be accepted?

A.—Of course.

MR. CHRYSLER: If you want to keep her over, you shut off the bees from the super and introduce that queen into the super by shutting the bees off from the brood chamber for forty-eight hours; then remove that super and the bees will go on with that queen successfully.

MR. McEVoy: Would you put a fine screen over the brood chamber?

MR. CHRYSLER: Yes.

Q.—If a queen has lately died and there is no visible preparation for another, will the introduced one be accepted?

A.—At once? I suppose so. I believe in visible preparation all the same.

MR. EVANS: Mr. McEvoy, you said you knew several cases where foul brood has been caused by introducing queens. Where did the queens come from? How did they come, and what were they fed on? Prepared food? Foul brood, Mr. McEvoy states, was caused by bees being brought forward in cages, and with prepared food. He states that that caused foul brood. Now he states that in introducing a queen you never get foul brood. Where is the difference between the bee and the queen?

MR. McEVoy: I suppose the food has diseased honey in it.

MR. COUSE: Why didn't the queen bring it?

MR. McEVoy: It is not caused by the queen but by the food; it would be the honey in the prepared food.

MR. TIMBERS: I do not think any foul brood honey ought to be mixed with the food.

MR. WHITSIDE: Are we to understand from Mr. Evans, that they sent foul brood candy over here?

MR. EVANS: In all the cages in which the queens are shipped there is candy which has in it some honey, and there is always the risk that there



is some contagion in candy made of that honey. I have imported some of Mr. Moore's, and have no reason to say that it has contained foul brood.

Mr. EVANS: I want to explain that Mr. McEvoy said foul brood had been introduced into the candy by the honey in cages of imported queens.

Mr. HERSHISER: This excitement about foul brood being introduced by imported queens, or shipped queens, I think, came up about a year or two ago, if I remember right. Mr. N. E. France, the Bee Inspector of Wisconsin, knew of one instance of foul brood having been introduced in this way, and that is the only specific instance that I know of, and I think it would be unjust to a queen breeder to spread abroad a mistake of this kind. He might have done it unintentionally. If an Inspector knows of this and he will advise of it, I think he will take precautions that it should not occur again. Did you know for a fact that this has been done in this way, Mr. McEvoy?

Mr. McEVoy: Yes, I know it.

Mr. HERSHISER: It is a kindness to all bee-keepers to advise them of this. Was it the same person that France knew of?

Mr. McEVoy: I don't know.

Mr. HERSHISER: I think what we want to do is to protect our beekeepers.

Mr. HOLTERMANN: We want to remember that the germ of foul brood has been discovered in the queen by three bacteriologists. Mr. Evans' proposition that we should not suppress the fact that foul brood may be brought into the hive through this infection of queens is perfectly correct. I am strongly in favor of getting good queens, for we should have better blood in the Province. At any rate, Mr. McEvoy's position in saying that he will not mention the name is a correct one. We may know things, and yet when it comes into a court of law, we might come in for very heavy damages.

Mr. McEVoy: I don't care anything about that.

Mr. HOLTERMANN: I think Mr. Hershiser's suggestion that the Inspector should advise the queen breeder of it is an excellent one.

Mr. EVANS: I think we ought to know distinctly and plainly how we can bring and introduce these queens without any danger.

Mr. COUSE: Supposing the queen breeder thoroughly boiled the candy in such cases, would there be any danger?

Mr. McEVoy: No.

Mr. COUSE: Why does he not do it?

Mr. HERSHISER: As Mr. Holtermann states that bacteriologists have discovered the germ of foul brood in the queen, I must suppose it is true, as three scientists have found it. But what I want to know is, whether the queen is capable of transmitting this disease to the colony, or whether the queen is perfectly safe if she has the disease.

The PRESIDENT: Prof. Harrison made the statement as Mr. Holtermann gave it, and I asked him some questions about it, and he said that the queen was taken right out of the hive when she was laying eggs, and it was found in the eggs. I said if that queen were taken out of the hive under the McEvoy treatment, and put in a hive where she could not use those eggs and those eggs dry up and the queen having no chance to lay for some days has no developed eggs in her, would she be likely to transmit the disease. He said that might make a difference. I would like to make a test along that line. The new eggs would be stimulated from pure food and not from the diseased honey and germs.

Mr. PETTIT: I would not like to run the risk.

The PRESIDENT: I think disease is very seldom carried from the queen: I would be afraid of the candy and the attendant bees.

Mr. PETTIT: If it is on the eggs, it gets on the combs.

The PRESIDENT: If the queen is caged for three or four days she becomes very small, and if you introduce her into a hive she will not lay for two or three days, and then those eggs will be developed from the pure food.

Mr. ROACH: If you put her in the cage there is no danger.

The PRESIDENT: Mr. McEvoy's treatment has proved successful; I do not think any one questions it. He takes a diseased queen from a diseased colony and he shakes them off the foundation and leaves them there three days, and then he shakes them again, and it is impossible for that queen to transmit the disease.

Mr. McEVoy: The queen does not give it.

Mr. HOLTERMANN: There is a little matter of a good deal of importance I wish to bring to your notice. I am not an advocate of mere formal votes of thanks. I think there is a good deal of time wasted over matters of this kind. But there is a matter upon which I think we shall all be agreed. We understand that under the new act and under that which has been recommended by this Association, Mr. William Couse will not be Secretary any longer. For some time time he has been desirous of not retaining that position. It is his own recommendation that Mr. Hodgetts, or some one else in the Department, will be appointed Secretary; and I think it will be contrary to our wish that he should leave that position without a very hearty vote of thanks on our part. I want to say that I have known Mr. Couse for 25 years or more, and he is the man who in this position, or in any other, will do that which he sincerely thinks is right. We may not always agree with him, but I believe he has served this Association faithfully and well, and to the very best of his ability, and I would move a very hearty vote of thanks to him for the work he has done for this Association in the past. We regret so far as he is personally concerned that he has withdrawn from that position, and at the same time I would say that I hope and believe that in the place in which the new Secretary is that he will be able to do the work for the Association which a private individual could not do, and which will be in the interests of that Association.

Mr. HOLMES: It is with deep regret that we learn of Mr. Couse's intention to sever his connection with us as Secretary of this Association, and it is with great reluctance that we bow to his decision. It is with very great pleasure that I second the motion that the best thanks of this Association be tendered to Mr. Couse for his valuable services.

The PRESIDENT: It is a pleasure to me to put that motion to you. I have, of course, had a good deal of experience under Mr. Couse. I started with him when I was sixteen years old. I think that he loves this Association, and that he is sorry in one sense that he is forced to give up the Secretaryship. I think that for a number of years if it had not been for that love he would have given up that position, but his other duties are so numerous that he has been making a great sacrifice in doing the work. You might still possibly have retained him, only he feels confident that the work can be done better in another way, and he still be serving the interests of this Association. I therefore tender to Mr. Couse the vote of thanks moved by Mr. Holtermann, and seconded by Mr. Holmes. (Applause).

Mr. COUSE: I really appreciate this. It was with reluctance that I accepted the position something over 21 years ago. The responsibility was then literally thrown upon me, and when you put the responsibility on to a person, if he has a certain amount of ambition, he will attempt to bear it. I might say my ambition has been to serve the Association well. I hated to go through with it and make a failure. I have had a certain amount of labor



in the 21 years. I suppose if the total number of hours were taken, it would be found that they were very numerous. That is past now, but I have a great asset at the present time for all these hours, the greatest asset a man can have—life-long friends. I feel that I have not made any enemies. I think if a man can keep his position for 21 years, and have no enemies he is fortunate; it is a position to be appreciated. The vote of thanks you have passed makes me think you have appreciated what I have done. I have had relations with other Presidents in the Association, but up to date, I have never had any real unpleasantness with any of them. They have always aimed to do what they thought best, and I stand here convinced that with almost every President of the Association, they have been most honest in trying to do something for the Association and the Bee-keepers of the Province. That is a pleasing thing to state. Men are very contrary, and the most contrary man is the most honest man. To-day my duties at my business have increased to a great extent and I have not the time to continue those in connection with this Association. I spoke once or twice last winter to the Minister of Agriculture, that I thought it would be wise if the Secretaryship were in the Department, and if the man who took it had a stenographer there would be a good chance of distributing all information possible. Mr. James said that business could be despatched much more quickly in the Department than if they employed some party outside of the building. I said even if I wanted the position, I saw clearly that the work for the Association could be done in the Department much better than outside. I have worked for the interests of the Association as well as I could. I have spent a month this year, not far short of one month out of the twelve, on the work of the Association, but my other duties are so numerous that I cannot continue. I am very glad that I have served for such a length of time, and can quit with the feeling that we have now a great Association. I am very grateful for the vote of thanks.

Mr. HOLTERMANN: There is another important matter I wish to speak about. I was up at the Parliament Buildings in connection with it. During the course of next winter there is to be a revision of the Joint Stock Companies Act and this will effect these Companies generally. I went up to the Department and saw Prof. James and suggested to him that bee-keepers should have the same privileges that dairymen have in connection with the formation of Joint Stock Companies for the sale of their products, and Mr. James thought it was a very good idea. I asked him if he would draft a resolution that could be presented before the Association, and I have this now in hand, and he said if we saw fit he would submit it to the Hon. Mr. Hanna, and when he was drafting the act he would draw the attention of the Legislature in this matter.

“To the Hon. Mr. Hanna:

“That the bee-keepers feel the need of provision whereby they can organise companies for handling their products with as little expense as possible, somewhat in the line of the dairymen and fruit men.

“That it is understood that a new Companies’ Act will be introduced at the next meeting of the Legislature to cover organizations and other companies.

“That the wants of the bee-keepers be considered in this matter and that a resolution be sent to the Hon. Provincial Secretary, Mr. Hanna.”

Mr. CHRYSLER: I think it is one of the best things we could put our attention to. I know what the Chatham Fruit Growers’ Association has done

for several years back. It is probably eight years since they began, but they are now a Joint Stock Co. It has not cost one of its members one cent. I do not suppose it is much use giving you all the troubles it has had to go through during the last few years, but they have resulted in this, that each member has contributed a certain amount of stock in the way of fruit, and they have built a big warehouse, packing stand and so on, and they hire men, etc. They have a President and Directors and elect a seller and a packer on a percentage. The seller gets so much to sell our fruit in the Northwest, and he is bound to sell it in the most satisfactory way; the better he sells it the more money he gets; and the packer gets a certain percentage for packing the fruit also, and it is altogether a very satisfactory concern. Two years ago I looked at the books and found them in good condition, the only trouble was we were not incorporated, and were getting on dangerous ground, so last year we incorporated.

Mr. HOLTERMANN and Mr. CHRYSLER moved that the Department pass an act to enable bee-keepers to form incorporated societies for the sale of their products. Carried unanimously.

A resolution was passed thanking the York County Council for the use of the building in which the convention had been held, and also for the pleasing way in which the permission to use it had been granted.

A vote of thanks was also extended to all those who had taken part in the Convention, and to those who had written such excellent papers, and also to the President who had presided in such an able manner.

The PRESIDENT said he need not be included as the attention and patience shown testified to the way in which his efforts had been appreciated.

This resolution, moved by Mr. COUSE and seconded by Mr. LAING, was carried unanimously.

The WARDEN for the County of York said that if it had been a pleasure for the bee-keepers to meet in the room they were able to lend them, it had also been a pleasure for the members of the County Council to let them have that room. They had lost nothing if the bee-keepers had gained something. He hoped, however, that the bee-keepers had not left any stings behind them, that would make things warm for them at their next meeting on Nov. 26th. He hoped they had not brought any samples with them unless it was honey. He also said that if at any future time he might not be in a position to grant them the privilege of the use of the room he hoped the future members of the Council would extend that privilege to them.

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### DIRECTORS' MEETING.

The new Board of Directors met on November 9th for the election of officers and transaction of business.

On motion of Mr. ARMSTRONG, seconded by Mr. LOWEY, it was decided to give the *Canadian Bee Journal* as a premium to the members.

Mr. BROWN, seconded by Mr. DEADMAN, moved that the Executive be composed of the President, First and Second Vice-Presidents. Carried.

On motion of Mr. BROWN, seconded by Mr. HOLMES, \$200 was appropriated for the affiliated societies. It was decided to send out the spraying notices this year as usual, but that the offer of \$25.00 for the first conviction of an offence under the Act be rescinded and left off the notices.

It was moved by Mr. LOWEY, seconded by Mr. DEADMAN, that Mr. Sibbald be invited to help draw up the revised by-laws. Carried.



Moved by Mr. DEADMAN, seconded by Mr. HOLMES, that the Honey Show Committee consist of the Executive Committee together with the Secretary. Carried.

A number of accounts were passed for payment.

On motion the Executive were empowered to do any further necessary business.

The meeting then adjourned.

### EFFECT OF BEES ON PLANTS.

TORONTO, November 12th, 1906.

DEAR SIR,—You wrote us the other day asking what had been done with the resolution asking the Department to undertake experiments in order to determine the effect of bees on plants. The matter was referred to the Entomological Department at the Agricultural College, and Professor Sherman started an investigation and collected information in regard to experiments carried on in the United States. According to it, he stated that it had been proved that bees were absolutely harmless so far as flowers, plants and fruit were concerned. Professor Sherman resigned his position, and thereby the matter was lost sight of. However, I enclose herewith the opinion of Dr. Bethune, successor to Professor Sherman, who is Professor of Entomology. This covers the ground. I would suggest that you print this letter in the report of the Association for 1906, and thereby give it wide circulation. I will take the matter up with your successor, Mr. P. W. Hodgetts.

This information did not arrive in time for us to lay it before your Association while in session.

Yours very truly,

(Sgd.) C. C. JAMES,  
Deputy Minister of Agriculture.

W. COUSE, Esq.,  
Streetsville, Ont.

GUELPH, November 8th, 1906.

PRESIDENT CREELMAN, *O. A. College.*

DEAR SIR,—With reference to the desire of the Bee-Keepers' Association to have experiments conducted regarding the value of the work performed by bees in the fertilization of blossoms, I beg to say that such experiments have been repeatedly carried out during the last fifteen years or more at many of the Agricultural Experiment Stations in the United States, and that our own observations and those of Dr. Fletcher at Ottawa entirely coincide with the results that have been published.

It has been conclusively proved by repeated experiments carried on in widely separated localities that—

1. Bees are not in any way detrimental to any of the farmers' crops.
2. On the contrary it has been proved that when bees have been prevented from visiting the blossoms of apples, pears, cherries, strawberries, raspberries, clover and other plants, the yield of fruit was greatly reduced. Other insects, of course, assist in the cross-fertilization of blossoms, but bees perform the larger share of this office in the case of the plants above mentioned.
3. The structure of the mouth parts of the honey-bee is of such a character that the insect is unable to puncture the skin of grapes, peaches or other fruit. This, however, may be done by wasps and some beetles. When fruit has been cracked or punctured by other agencies, bees will take advantage of the opportunity of getting at the sweet juices, but they have not caused the initial injury. In some cases they may be regarded as doing a useful work by removing the juices that would otherwise cause the decay of sound grapes in the same bunch.
4. It is a well established fact that red clover depends upon bumble-bees and white clover on honey-bees for fertilization and production of seed. Without the agency of these insects no seed is matured.

With our knowledge of the good work performed by bees and their inability to injure crops in any way, there does not seem to be any necessity for conducting further experiments in this direction. Farmers and fruit-growers may rest assured that bees, apart from the commercial value of their products should be classed among their best friends.

Yours very faithfully,  
(Sgd.) CHARLES J. BETHUNE,  
Professor of Entomology.

## BY-LAWS.

1. This Association shall be known as the Ontario Bee-Keepers' Association, and shall be composed of those interested in bee-keeping who become enrolled as members by paying the annual membership fee of one dollar, or as provided in Clause 19 of the Constitution.

2. A general meeting of the members of this Association shall be held once a year, and shall be known as the Annual Meeting, the year to begin with the election of officers at such Annual Meeting and terminate on the election of their successors at the next Annual Meeting. At this Annual Meeting, or any other general meeting of this Association, ten members in good standing shall constitute a quorum.

3. The place of holding the next Annual Meeting shall be fixed by the members present at the Annual Meeting.

4. The Board of Management shall consist of twelve Directors, elected one from each of the following divisions:

Division No. 1.—Stormont, Dundas, Glengarry, Prescott and Cornwall.

Division No. 2.—Lanark, Renfrew, Carleton, Russell and Ottawa.

Division No. 3.—Frontenac, Kingston, Leeds, Grenville and Brockville.

Division No. 4.—Hastings, Addington, Lennox and Prince Edward.

Division No. 5.—Durham, Northumberland, Peterborough, Victoria and Haliburton.

Division No. 6.—York, Ontario, Peel, Cardwell and Toronto.

Division No. 7.—Wellington, Waterloo, Wentworth, Dufferin, Halton and Hamilton.

Division No. 8.—Lincoln, Niagara, Welland, Haldimand and Monck.

Division No. 9.—Elgin, Brant, Oxford and Norfolk.

Division No. 10.—Huron, Bruce, Grey and Perth

Division No. 11.—Essex, Kent, Lambton, Middlesex and London.

Division No. 12.—Algoma, Simcoe, Muskoka, Parry Sound, Nipissing and Manitoulin.

Also one Director from the Ontario Agricultural College and Experimental Farm.

The Board of Management shall from among themselves, elect a President, and two Vice-Presidents.

They shall also appoint from among themselves, or otherwise, a Secretary and a Treasurer, and shall also appoint at least three of their number as an Executive Committee.

5. Five members of the Board shall constitute a quorum.

6. Vacancies on the Board by death, resignation or non-acceptance of position, may be filled by the President, subject to the approval of the Executive Committee.

7. The officers of this Association shall be elected by ballot, with the exception of the Auditor, who may be elected by an open vote of the Association.

8. It shall be the duty of the President to preside at all meetings of this Association; to call for reports; to put motions when seconded; to decide upon questions of order, and to declare the result of ballots and elections. The President, in connection with the Secretary, shall have power to call special meetings when necessary. The President shall be *ex-officio* chairman of the Board of Directors, and shall call it together when necessary.

9. In the event of the death or absence of the President, the Vice-President shall discharge his duties.

10. It shall be the duty of the Secretary to keep and preserve the books of the Association; to call the roll and read the minutes at every meeting of the Association; to conduct all correspondence of the Association; to receive and transfer all moneys received for fees and otherwise to the Treasurer, having taken a receipt for the same; to make out a statistical report for the Association and for the Government; to furnish the officers of the County and District Associations with forms for organization and annual reports and to give notice of Association and Board meetings through the press or otherwise.

11. It shall be the duty of the Treasurer to furnish such securities for the moneys of the Association as the Board may determine; to receive from the Secretary all moneys belonging to the Association, and to give receipts for the same; to pay them out on order endorsed by the President and Secretary, and to render a written report of all receipts and disbursements at each Annual Meeting. He shall give security as provided by Clause 17 of the Act respecting Agricultural Associations.

12. Any County or District Bee-Keepers' Association in the Province of Ontario may become affiliated with this Association on payment of five dollars, which shall be paid to the Secretary on or before the first day of June in each year; but every local Association so affiliated must have on the membership roll at least ten members who are also members of the Ontario Bee-Keepers' Association at the time of its affiliation,



and must continue to have a like number of its members on the roll of this Association while it remains in affiliation.

13. Every affiliated Association shall receive an annual grant out of the funds of this Association. The amount of such grant shall be fixed by the Board from year to year.

14. All grants to affiliated Associations shall be expended in prizes for honey shows, or for shows of aparian appliances, or for lectures on subjects pertaining to bee culture, or for advertising district or county meetings, or for any or all of these, and for any other purpose not inconsistent with the objects of the Ontario Bee-Keepers' Association.

15. Every affiliated Association shall report to the Secretary of this Association (on a form to be supplied by the Secretary) ten days before the Annual Meeting of the Ontario Bee-Keepers' Association, which report shall be signed by the President and Secretary of the affiliated Associations.

16. County or District Associations seeking affiliation should forward to the Secretary an application according to the following form: "We, whose names are written in the accompanying form, having organized ourselves into a County (or District) Association, to be known as County (or District) Association No. —, desire to become affiliated to the Ontario Bee-Keepers' Association, and we agree to conform to the Constitution and By-laws of said Association."

Form of application as follows:

Names of those already Members of the O. B. K. A.	P. O. Address	Fees.	Names of those not already Members of the O. B. K. A.	P. O. Address	Fees.	Remarks.

17. Every affiliated Association that neglects or refuses to pay the annual affiliation fee, or neglects or refuses to forward to the Secretary the annual report on or before the date fixed, may be deprived of their affiliation privileges by the Board.

18. Should an affiliated Association become defunct after payment to it of the grant from this Association, any unexpended balance of said grant shall be forfeited and paid over to the Treasurer of this Association.

19. Membership fees of affiliated Associations shall be at least fifty cents. Any such members may become members of the Ontario Bee-Keepers' Association by paying an additional fifty cents to the Secretary of the affiliated Association, who shall forward said fee to the Secretary of the Ontario Bee-Keepers' Association.

20. Each affiliated Association shall be entitled to the services of an Association lecturer (when such exists) once in each year, half the expenses connected with such lecture to be borne by the District or County Association and half by this Association.

21. The order of business by which the meetings of this Association shall be governed shall be at the discretion of the President, but subject to appeal to the meeting when objection is taken, when a majority vote of the members present shall decide on the objection, and in such cases the vote of the majority shall be final.

22. These By-laws may be amended by a majority vote of the members present at any Annual Meeting, or at a special meeting of the members called for the purpose of considering the same, and of which at least two weeks' notice shall be given by public advertisement.

## APPENDIX.

### AN ACT FOR THE SUPPRESSION OF FOUL BROOD AMONG BEES.

CHAP. 51, 6 EDWARD VII., 1906.

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :

1. This Act may be known as "*The Foul Brood Act.*"

2. The Lieutenant-Governor in Council upon the recommendation of the Minister of Agriculture may from time to time appoint one or more Inspectors of Apiaries to enforce this Act, and the Inspector shall, if so required, produce the certificate of his appointment on entering upon any premises in the discharge of his duties. And the Minister shall instruct and control each Inspector in the carrying out of the provisions of this Act. The remuneration to be paid to any Inspector under this Act shall be determined by order of the Lieutenant-Governor in Council.

3. The Inspector shall, whenever so directed by the Minister of Agriculture, visit without unnecessary delay any locality in the Province of Ontario and there examine any apiary or apiaries to which the said Minister may direct him, and ascertain whether or not the disease known as "foul brood" exists in such apiary or apiaries, and wherever the said Inspector is satisfied of the existence of foul brood in its virulent or malignant type, it shall be the duty of the Inspector to order all colonies so affected, together with the hives occupied by them, and the contents of such hives, and all tainted appurtenances that cannot be disinfected, to be immediately destroyed by fire under the personal direction and superintendence of the said Inspector ; but where the Inspector, who shall be the sole judge thereof, is satisfied that the disease exists, but only in milder types and in its incipient stages, and is being or may be treated successfully, and the Inspector has reason to believe that it may be entirely cured, then the Inspector may, in his discretion, omit to destroy or order the destruction of the colonies and hives in which the disease exists.

4. The Inspector shall have full power, in his discretion, to order any owner or possessor of bees dwelling in box-hives, in apiaries where the disease exists (being mere boxes without frames), to transfer such bees to movable frame hives within a specified time, and in default of such transfer, the Inspector may destroy, or order the destruction of, such box hives and the bees dwelling therein.

5. Any owner or possessor of diseased colonies of bees, or of any infected appliances for bee-keeping, who knowingly sells or barter or gives away such diseased colonies or infected appliances, shall on conviction thereof, before any Justice of the Peace, be liable to a fine of not less than \$50 or more than \$100, or to imprisonment for any term not exceeding two months.

6. Any person whose bees have been destroyed or treated for foul brood who sells or offers for sale any bees, hives or appurtenances of any kind, after such destruction or treatment, and before being authorized by the Inspector so to do, or who exposes in his bee-yard, or elsewhere, any infected comb, honey, or other infected thing, or conceals the fact that said disease exists among his



bees, shall, on conviction before a Justice of the Peace, be liable to a fine of not less than \$20 and not more than \$50, or to imprisonment for a term not exceeding two months, and not less than one month.

7. Any owner or possessor of bees who refuses to allow the Inspector to freely examine said bees, or the premises in which they are kept, or who refuses to destroy the infected bees and appurtenances, or to permit them to be destroyed when so directed by the Inspector, may, on the complaint of the Inspector, be summoned before a Justice of the Peace, and, on conviction, shall be liable to a fine of not less than \$25 and not more than \$50 for the first offence, and not less than \$50 and not more than \$100 for the second and every subsequent offence, and the said Justice of the Peace shall make an order directing the said owner and possessor forthwith to carry out the directions of the Inspector.

8. Where an owner or possessor of bees disobeys the directions of the said Inspector, or offers resistance to, or obstructs the said Inspector, a Justice of the Peace may, upon the complaint of the said Inspector, cause a sufficient number of special constables to be sworn in, and such special constables shall, under the direction of the Inspector, proceed to the premises of such owner or possessor and assist the Inspector to seize all the diseased colonies and infected appurtenances and burn them forthwith, and if necessary the said Inspector or constables may arrest the said owner or possessor and bring him before a Justice of the Peace to be dealt with according to the provisions of the preceding section of this Act.

9. Before proceeding against any person before a Justice of the Peace, the said Inspector shall read over to such person the provisions of this Act or shall cause a copy thereof to be delivered to such person.

10. Every bee-keeper or other person who is aware of the existence of foul brood, either in his own apiary or elsewhere, shall immediately notify the Minister of the existence of such disease, and in default of so doing shall on summary conviction before a Justice of the Peace be liable to a fine of \$5 and costs.

11. Each Inspector shall report to the Minister as to the inspection of any apiary in such form and manner as the Minister may direct, and all reports shall be filed in the Department of Agriculture, and shall be made public as the Minister may direct or upon order of the Legislative Assembly.

12. Chapter 283 of the Revised Statutes of Ontario, 1897, entitled *An Act for the Suppression of Foul Brood among Bees*, is repealed.

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REPORT  
OF THE  
FARMERS' INSTITUTES  
OF THE  
PROVINCE OF ONTARIO  
1906.

PART I.—FARMERS' INSTITUTES.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO



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1907



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TORONTO.

*To the Honourable WILLIAM MORTIMER CLARK, K.C.,*  
*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR:

I have the pleasure to present herewith for the consideration of your Honour the Report of the Farmers' Institutes of Ontario for 1906.

Respectfully submitted,

NELSON MONTEITH,

*Minister of Agriculture.*

TORONTO, 1907.



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TWELFTH ANNUAL REPORT  
OF THE  
FARMERS' INSTITUTES OF ONTARIO  
FOR THE YEAR  
1906.

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*To the Honorable the Minister of Agriculture :*

SIR,—I have the honor to present herewith the twelfth annual report of the Superintendent of Farmers' Institutes. Formerly this report was published in three parts: Part I., corresponding with this volume; Part II., Report of the Women's Institute; Part III., list of meetings, speakers and their subjects, statistics for the year, etc. What was formerly known as Part III. is now known as Part II., and the Women's Institute Report is no longer published as part of the Farmers' Institute Report.

It is indeed gratifying to be able to report that the interest manifested by the officers of the Institutes and the farmers generally is well maintained. Unsolicited comments from Institute workers would indicate that the meetings held during the season 1906-07 were attended with greater interest and better results than in previous years. The meetings are from year to year partaking more of a practical nature. At many of them the officers of the Institute concerned furnished the lecturers with live animals to demonstrate their instruction on stock questions. An endeavor has been made to place the work upon a more practical basis, with the result that an increased interest has been created and the instruction has been of much more value.

*The Year's Work.* The records for the year indicate that the attendance is somewhat below the season of 1905-06, but considerably above the two preceding years. This slight decrease from last year can largely be accounted for by the fact that many of our Ontario farmers have left for Western Canada, and then, again, the Institute meetings are devoted more to instruction and less to entertainment, only those attending the meetings who are desirous of *learning* somewhat more relating to their business. While the total attendance is somewhat less than in two or three former years, we are not to infer from this that the interest is lagging or that the good accomplished is less.

*Special Work.* In addition to the regular and supplementary meetings that have been held regularly from season to season for a number of years, this Department arranged last season for a number of special meetings in the interests of bacon production, improvement of seed and destruction of weeds, and the organization of co-operative fruit associations. Further particulars regarding this work will be found in Part II.



*Women's Institutes.* These organizations have increased in number, and the work has been extended to new territory. We now have in the Province seventy-eight district institutes, over four hundred branches, with a membership of about eleven thousand. The Farmers' Institutes have co-operated in furthering the interests of the women's organization, and we believe that this co-operation has been mutually helpful. A number of inquiries have been received for organization meetings to be held in sections of the Province where the work has not yet been undertaken, and it is to hoped that in the near future we shall see live societies in every electoral district and very township of the Province.

*Articles and Special Reports.* It will be noted by Institute members that the number of addresses and papers given in the accompanying report is rather less than usual. In looking over the reports furnished to Institute members we find articles have been printed from time to time during the past few years which cover the field of Institute work quite thoroughly. We have pleasure, however, in presenting a few articles which should be read by all members with interest and profit. It is to be regretted that the number of papers contributed by officers and members of the Institute throughout the Province is not so great as in former seasons. It may be that the great advance which has been made in agricultural journalism during the past few years has to a certain extent overcome the necessity for so many special papers or addresses being prepared by local men. We are pleased to state that the articles which appear from time to time in the agricultural press are more than formerly used as a basis of discussion at Institute meetings and at Farmers' Institute Clubs. We would strongly advise every farmer to subscribe for one of our purely agricultural papers, or, at least, take one of the weeklies which are now devoting so much space to agricultural topics. The information imparted at a single Institute meeting is of much value to farmers, and such gatherings have the effect of creating more or less enthusiasm on the part of the farmer. Unless, however, the lessons taught and the interest aroused is followed by a close study and discussion of the reports sent out by the Department and articles in the agricultural papers, the greatest good will not result.

We wish to draw the attention of readers to the special reports which appear herewith. Each of these special reports we consider worthy of careful reading by the farmers, not so much because of the direct information which they contain as of the underlying lessons which may be gathered from the facts given. The article on "The Potato Industry" should be read and studied carefully by all farmers, as this is a crop which can be grown successfully in practically all sections of Ontario.

While the other special reports may appear to be of value only to a very small proportion of the farmers of the Province, they contain information and suggestions which should prove of value to all careful readers, whether or not they are engaged in the special industry reported upon.

GEO. A. PUTNAM,

*Superintendent.*

# SELECTED PAPERS AND ADDRESSES

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## HORSE FEEDING.

By H. G. REED, V.S., GEORGETOWN.

I suppose there is no subject pertaining to agriculture on which more has been written of late than that of feeding of farm stock. Indeed, so much has that been the case that I feel but little has been left to be said. However, it is my intention to discuss in the present article not so much economic and profitable feeding as to endeavor to point out the relation that exists between the manner in which a horse is fed and some of the most ordinary diseases from which he is likely to suffer.

Heaves, for instance, is a disease much too common in our Province, and my observation has led me to the conclusion that a larger percentage of farm horses suffer from this malady than in the towns and cities of our country, and the reason for this is, in my opinion, due to the fact that a large number of our farmers feed too much hay.

No horse requires more than one full feed of hay once in the twenty-four hours. When farm horses are working every day they are subject to just this condition, because they have not time either at their morning or noon meal to eat too much hay, but in winter they often stand all day with hay before them all the time.

A horse to be in perfect health should have the stomach emptied of the previous meal for two or three hours before he is given another. If such is not the case, digestion will not take place in a perfect manner, and disease is likely to result. There is a remarkable sympathy between the stomach and the lungs, because of the fact that the same nerve trunk supplies nerve force to both organs. When the stomach is deranged from improper feeding the lungs are liable to become sympathetically affected, and heaves often result. Care should also be taken that a horse should be fed no dusty or musty hay. This dust is as light as air, and the horse in breathing draws it right into the lung tissue with every breath, and this substance, being an irritant, is very prone to develop heaves. If no better hay can be obtained, the dust should be laid by sprinkling with water, when the horse will not breathe it, but it will be swallowed with his feed and probably do him no harm; but when at all possible only bright, clean hay, free from dust, should be fed to horses. Again, no horse is in fit condition for active exercise with a stomach distended with hay, because the stomach, situated as it is right behind the lung space, if full, bulges forward into the chest to such an extent that the lungs have not room to properly expand, and cannot perform their functions properly; and anything that interferes with the function of the lungs predisposes to heaves. In many cases if farmers would feed one-third less hay to idle horses in the winter months they would come out in the spring in better condition, and we would have fewer cases of heaves in the country than we have at present.

**INDIGESTION.** Indigestion is another disease usually produced by irregular or improper feeding, such as a horse getting access to the grain bin, a too sudden change from one kind of food to another, or a too sudden increase in the amount of grain fed. The last named cause has probably produced



more cases of indigestion, especially in farm horses in the winter, than any other, and we do not need to look far for the reasons. Most farm horses are comparatively idle in the winter, but it often happens that some business on the farm necessitates a long drive, or some other hard day's work, and the owner will give probably twice as much oats for breakfast than the horse has been in the habit of getting in order to brace him up for a hard day's work. The horse, being soft for want of regular exercise, will naturally become weary on his journey, and the stomach will become weary, too, in sympathy with the muscular system, when it too often refuses to perform its functions. The process of digestion ceases when fermentation of the undigested mass in the stomach takes place. Gases are formed which cause the animal to bloat. He will show symptoms of pain, and a case of indigestion is the result. Now, if the horse had only received his ordinary grain ration the chances are that before he had become weary on his journey the stomach would have completed its work and would have been completely empty, in which case a very acute attack of indigestion would have been impossible. It is a good rule never to give a horse an extra big meal to stiffen him up for a hard day's work. This act of mistaken kindness has cost many an owner the life of a good horse, and has stopped many a farmer on his journey with a sick horse, besides having a veterinary bill to pay.

**LYMPHANGITIS.** Lymphangitis is a disease quite prevalent among farm horses, especially in sections where the heavy draught horse predominates. It usually occurs in well-fed animals that have been a day off work. In the Old Country it is sometimes called "Monday morning fever," from the fact that more cases are reported on Monday morning, after Sunday's rest, than any other day of the week. A horse getting three full grain meals each day has generated in his system a large amount of heat and energy, which is just what he needs to enable him to perform the work expected of him; but when he has a day off work, if he gets his full grain ration, there is just as much heat and energy developed, and as he is getting no exercise, there is no vent for it. It is the function of the lymphatic glands to dispose of this excess of nourishment. Failing in this they become inflamed, and an attack of lymphangitis results. If the grain ration was reduced or a bran mash substituted there would be much fewer cases of this disease. Repeated attacks always leave the legs permanently enlarged, a most unsightly blemish, which materially reduces the market value of the animal. If proper care was taken in feeding and exercise this disease would not be nearly so common as at present.

**AZATOURIA.** Azatouria is becoming much more prevalent among farm horses than formerly, because of the fact that they have as a rule little to do during the winter months. It is likely to occur in horses that have been well fed and allowed to stand idle in the stable for a few days; when put to work they start off all right, but as they proceed at their work they become dull and sluggish, lose power in the hind-quarters, and if kept at work will usually in a short time fall down and will be unable to rise again. This is a serious disease, and one that always calls for veterinary help; but if horses were carefully fed and regularly exercised there would be very little or no danger of them suffering from this malady.

In fact, no horse should be allowed to stand for even one day without exercise, if the health of the animal is valued by the owner, and it is just because those two most important adjuncts to health, "careful feeding and regular exercise," are not properly attended to that we have so much sickness among farm horses, especially in the winter months.

## THE NEEDS OF THE HORSE BREEDING INDUSTRY OF ONTARIO.

BY DUNCAN ANDERSON, ORILLIA

There is no more attractive and fascinating line of animal husbandry on the farm than that of breeding and raising horses of a kind and type suitable in their early years for farm work. When matured and fitted for market they are one of the most profitable lines of farm production, more especially so in view of the high prices that do now, and are likely for some years at least, to prevail. The opening years of the twentieth century will in Canada show an era of agricultural, railway, and general development. With a steady stream of immigration pouring into our unbroken prairie lands, the tilling of which will cause an increased demand for horses for many years to come, our commercial, manufacturing, seaport, and populous centres will always prove a never-failing, high-priced market for our large, strong, good quality commercial geldings. It may be in Britain, in seaport towns and shipping points, where wheeled vehicles run for twelve months in the year, that the traction auto is likely to supersede the draft horse. But as long as it is fashionable for the large milling and brewing firms to vie with one another as to who can have the best turnout, using the heaviest good quality horses that money can buy, keeping them well groomed and in high condition, loaded with harness glittering with silver and brass mounting, acting as an attractive, ornamental advertisement for some special brand of flour or beer, there will always be a high-priced, brisk demand for horses of this kind. But at present the extraordinary home demand prevents dealers from cultivating the export trade.

**THE KIND TO BREED.** Farmers can make no mistake in breeding the right kind of heavy horses. The best of them would be suitable for city dray work; the second grade would find a place in the railway construction or lumber camps. The undersized of draft type is particularly well fitted for farm work, with our increasing heavy agricultural implements and machines of wide scope and heavier draft, requiring stouter built, more compact, weightier horses to handle them. It is a very serious mistake to breed a class of light, or driving horses, unless the breeder has in his mind firmly fixed ideals. Too many of the stallions from which harness horses are bred are of very poor quality, possessing neither speed, stamina, nor style. Many are but low-grade hacks that should never have been used for breeding purposes, the reproduction of which has, in some parts of the Province, left large numbers of very inferior road horses. They are not strong enough for farm work, and were it not for the extraordinary present demand for horse flesh of every kind they would be unsaleable, and many stables would be filled with a class of undesirable, food-consuming horse stock. But when anyone has the skill and capital to breed, raise and train good quality road horses, it proves, in capable hands, a very lucrative line of horse production. Few men have the ability and the inherent knowledge of the laws of breeding and the skill in mating to produce the highest class of road or carriage horses. But the farmer is on a safe line when he stays tenaciously with the draft horses.

In selecting a stallion he should be sound and free from blemishes. We can only successfully grade up our stock by keeping to the one breed. The greatest drawback to live stock improvement in every line is the mixing of breeds. A steady, fixed course of grading up, firmly and persistently adhered to, is the only way to get satisfactory and profitable results.



I would prefer to use a compact, well-built sire rather than one that is too heavy. The mare should be large, somewhat loosely built, of open conformation, with well-formed limbs. A close, firm built mare is too often a shy, uncertain breeder.

The stallions of my knowledge that have left good stock have had heads that would be called undersized, but the face lines were clean cut, the eyes bold and very prominent, the ears a trifle short, but carried well, and their movement very active; such have always proved impressive sires. It is seldom we find the neck too long. It should be clean cut at the junction with the head, but blending snugly into a sloping shoulder. This shape of shoulder gives a short back. A close coupled loin to a short back gives strength in the upper line, but to get a long, free stride there must be length from the shoulder point to back of thigh. The hind quarters and lower thighs both inside and out, should be well muscled. In my experience the horse that has a strong, heavy sinew running down the inside of the thigh, ending before it comes quite down to the hocks, makes the most powerful kind of a horse.

The front feet and hocks are the two points in a draft horse that comes directly in contact with the hard work. I think there is no single point in the horse that has more work to perform and is more subject and liable to disease than the hocks. See that they are wide, clean and strong. A stallion with short, thick, coarse, boggy hocks should be avoided. The leg bones should be flat, cordy, and strong, shaped like a razor blade, with the thick part forward. Hind pasterns should have a good slope. Feet should be sound and well shaped.

A good length of rib, well sprung from the back, is essential. Too many of our draft stallions have long, light middle ribs and short hind ribs, giving a tucked-up flank. A horse with that conformation can neither stand feed nor work.

The feet should be large and waxy in appearance. The frog plump and elastic. Sound, open-heeled feet that are neither flat, brittle, nor contracted are the important points, along with sound, clean hocks. They should be inherent characteristics in both sire and dam. These points are imperative where the highest class of draft horses are being raised for city work. There the streets are laid with either asphalt, cement, causey, or broken stone, and sound, open-heeled feet, with large hoof-heads are such important points that no breeder can afford to overlook them. The present day show ring demands a straight, regular, true action, with a free uniform flexing of hock and knee. Judges are almost as critical about the show action of a draft horse as they are in hackney classes. Sometimes I think we are too apt to overlook the cardinal functions of a draft horse—the power to draw heavy loads. A good horse must have a well balanced, even temper, so that under all conditions, on the steep hill, in deep snow, in either hard or soft footing, he must willingly put his shoulder to the collar and draw as true as steel. A medium sized head, with clean-cut face lines, broad forehead, and prominent, mild eye are sure indications of an intelligent, teachable disposition. But a coarse, big head, with a sunken, dull, small eye, is nearly always associated with a sluggish, obtuse disposition that you can neither teach nor trust, and often, when the load gets into a bad spot, will either see-saw back and forth on the double tree, or throw his head over the shoulder top of his working mate. The stallion that has a bold, clear, mild eye should be chosen to find the desirable disposition in the offspring.

The pregnant mare, during the winter months, should be kept at light work, right up to time of foaling; in fact, the best success is often obtained

by keeping the mare at field work until day of foaling. She should not be overworked. Avoid travelling her over very soft land. She will be apt to become leg weary. I like to have her in the plow furrow, where she is always sure of firm, solid footing. One of the principal causes of mares aborting their foals is a too free access to the water trough in winter. A sudden chilling of the whole system with a gorge of ice-cold water is one of the chief causes of abortion. She should be watered twice a day, not over one and one-half pails at a time, and that she should drink slowly. Nor should she be fed much boiled feed. Soft, mushy food has a tendency to force an over-fat growth in the fetus (embryo foal), that, when dropped, will lack spirit and vitality, and for the first few weeks will require very careful coddling, but too often will pine, languish, and die. Ideal winter conditions for a pregnant mare is to have her in harness almost every day, at slow work. Feed her clover hay at noon, clean oat straw all she will eat, and a gallon of crushed oats twice a day, with a little dry bran added. Nor should very much roots be fed, a few twice a week will be quite sufficient. When roots are generously fed they have the same tendency on the foal as soft-boiled feed. After foaling, a mare should have at least two months' rest. After that she will do a reasonable amount of farm work, as long as she is not overheated. Never allow the foal to run with the mare while at work. It should be kept in a roomy box-stall, and it will soon learn to eat, and give less trouble at weaning time.

The first winter is the important time in a colt's life. If neglected then by want of feed, exposure or too close confinement, the loss can never be regained. The aim should be to keep the colt in good, growing condition from liberal feeding and plenty of exercise. Three quarts of crushed oats per day, a feed of boiled barley mixed when hot with bran, four times a week, and all the good hay it will eat; and, unless very stormy, it should have at least three hours' exercise every day in a yard or paddock. The surest way to ruin a colt is to keep it in a close box or stall all winter. Exercise is all important, as it grows bone and hardens the muscle. I would like to emphasize this, that the most successful horse breeders always feed their colts well and give them plenty of exercise, especially during the first winter. Examine the colt's feet, keep the toes from growing long by rasping the hoof into shape. This should be attended to before putting the colt on to pasture. If it is neglected the hoofs will break up. Many a horse goes through life with poor feet because they were not properly attended to when young. The same amount of hay and grain feed will do the second and third winters as the first, only more straw and roots. I have found Swede turnips an excellent succulent feed for growing colts. A couple or three turnips a day will help keep them in condition.

Some care should be used the first few days when the colt is put to work. It is best to break him in in the cool, fall months, when the colt is rising three years old, by putting him to plow, with a steady mate, placing the colt in the furrow, giving the young horse some advantage on the double-tree, and working half a day at a time. Pay close attention to his shoulders; when resting move the collar from the shoulder to allow it to cool; if this is not done there will be scalded shoulders. When once the skin on the collar seat gets broken it is sometimes very difficult to get it healed.

**MARKET CONDITION.** It does not pay to sell a lean horse any more than it does to sell a steer that is low in flesh. To get anything like a horse's value he should be in at least good, if not high, condition. Good hay, crushed oats, faithful grooming, combined with liberal exercise, will bring a horse to best condition. Feed oats four times a day; smaller feeds give



better results in fattening a horse than too much grain fed at a time. Oats and barley, with a little flaxseed boiled and dried up with bran, fed four or five nights in the week, in addition to the above treatment, will soon put a horse in fine market condition. With liberal feeding a gain of 100 pounds a month is quite common. When horses are in good condition it adds at least 25, if not 30, per cent. to their value.

To summarize, the needs of the horse breeding industry of our Province are: More discrimination in breeding; staying tenaciously with a breed; using more judgment in mating. The paying of liberal service fees for the use of good quality stallions; feeding the colts well, especially the first winter. All stallions should be examined once a year by a competent veterinary surgeon, and, unless they are sound, should not be allowed to stand for service.

## SHEEP ON THE ONTARIO FARM.

BY JOHN CAMPBELL, WOODVILLE.

Growing feeds of different kinds is the first step towards success in agriculture now-a-days. That done the ultimate profit depends on what use is made of our grown products. Without due consideration we often do as our neighbors do, never waiting to ascertain for ourselves whether their methods are the best for us to copy, or not.

One of the contagious cries throughout our Province is that "sheep are hard on grass." What does that mean? The explanation as a rule is that a dozen cows are pastured where there is grass enough for ten, and as many sheep are put in also. Need one wonder that the grass is eaten off to the plant crowns, seriously checking growth, and the animals not properly fed? But why blame the innocent sheep, when the owner is the one at fault? Given a suitable farm—the unsuitable ones are in the minority—and acre for acre, grass fed off by a well managed flock of market sheep and their lambs, will yield more clear profit with less labor than any other farm animal, and the time spent in caring for the flock is practically nil.

We read and hear a great deal these latter days about the excellent returns from some dairy herds. There are many such, of which the owners may be justly proud, and be well satisfied with. But what of the *average dairy cow*? It is given as a certain fact, repeated and repeated over and over again, everywhere dairymen assemble that 3,000 or less pounds of milk is her average animal production. We all know that the average amount no more than pays for her keep. That cow requires regular attention twice daily at the very least, Sunday and Monday, holiday and every day, no matter what comes or goes, besides the extra labor of feeding, watering and care-taking. Yet for all that many owners of unprofitable dairy herds have discarded the profitable, easy-cared-for sheep without ever counting the cost, often simply because a neighbor across the line fence, "guessed" there was nothing in sheep. The faithful friend discarded to make room for more "cow boarders" which eat the value or more of all the milk they give. "Going with the crowd" soothes the doubt of the best course to pursue.

While at Institute work the past two or three years this thought often forced itself forward, "Were any other business carried on in so happy-go-lucky kind of a way as many of us are guilty of on the farm, what would be the results?"

Henceforth Ontario farmers must in order to win possible success, be clear-headed calculators, and reckon cost and returns closely. When that is done few farms will be seen without its flock of sheep. Some may make a speciality of breeding and finishing for the common markets, and there is ample room for great success in that line because of favorable conditions in some sections. Many of the most successful British farmers carry on that line of sheep-husbandry with great profit, and Ontario has many advantages which they have not.

These years a ewe flock's fleece will pay for its wintering, at an average of nearly \$2.00 per head. Nearly all 100 acre farms would carry a dozen to twenty breeding ewes, as a side line. The cost of keep would be comparatively small as they would pick up much that would otherwise waste, besides keeping in check the most of the troublesome weeds which are rapidly infesting our country. In this connection the testimony of an Institute attender last winter may be stated. He said "My farm was clean years ago; had a flock and like others sold it off. Sheep went and weeds came in such numbers that a flock was again bought and with most gratifying results. The sheep came back and the weeds began to disappear, and now my farm is clean again."

Let us next notice the profitable side. A lamb and one-quarter per ewe is a moderate estimate, as many flocks do much better.

Then 20 ewes fleece yearly, worth saved.....	\$36 00
and 25 finished lambs sold in March, or April	
at \$9.50 each .....	237 50

\$273 50

A sufficient sum to pay the rent of an average 100 acre farm in the better sections of our Province. Besides it is equal to the original value of the investment, plus a large part of the cost of keep for the year. Were we to consider the possible profits in pure-bred sheep-husbandry for which Ontario is so famous, figures could be produced which would scarcely be accepted as correct by many. But when year by year the Ontario Sheep-breeders, at the greatest live stock show in the world—the "International" at Chicago—compete with such over-whelming success, does it not prove that the necessary conditions for the successful carrying on of this line of live-stock husbandry are more favorable? And when Ontario flocks can at World's Fairs such as St. Louis win on large Exhibits, an average of over \$80.00 per head of prize money, who can say that there is another kind of domestic animal which can make out so good a showing. We do know it is possible in raising fine-bred sheep, to have grass land in Ontario produce \$50.00 to \$75.00 per acre annually. Therefore the conclusions are most important in connection with successful farming in Ontario, and that the man without a good flock—be they pure-breds or grades, misses the assistance of one of his very best friends.

## SELECTION OF CATTLE FOR BEEF PRODUCTION.

BY SIMPSON RENNIE, TORONTO.

This is a difficult problem in any country where progressive dairying is carried on to such an extent as it is in the Province of Ontario, at least, to select any great number of good beefing animals, such as would be a credit



to Canada when fattened and placed on the British market. In many districts the cattle are getting so mixed with Jersey, Guernsey and Holsteins that few suitable animals can be procured for beef.

In selecting even the color or markings of the above breeds should be guarded against, for that which is seen on the outside is apt to indicate what is in the inside. The purchaser in making his selection should consider whether the cattle are to be finished on the grass, enclosed in loose boxes, or tied in the stable. If for grassing the Herefords or a cross do well and make very good cattle. They being active on foot and great rustlers. The Polled Angus or Angus grades are excellent cattle for feeding, especially so in loose boxes where a number are fed together. They are fairly active on foot, and being void of horns are not apt to injure themselves, and this breed of cattle yield a great weight of beef to the 100 lbs. live weight of the animal, and beef of first quality. But for stall feeding in the stable, at least in the opinion of the writer, there are not any to equal the Short-horn and their grades. They are of quiet disposition, mature early, and attain to a great weight. The following are some of the points to be considered in selecting beefing animals:—

The back should be straight, broad, and well fleshed for this is where the most valuable cuts are. The ribs should be long and well sprung, a short ribbed animal is seldom a good thriver. The hook-bones should be wide apart to match the width of the animal but not prominent. Short straight legs, set well apart with the ham extending well down to the hock are desirable points. I like a good depth from the loin to the flank, as well as a good heart girth, and prominent brisket with neck straight, smooth and not very long. The head wide between the eyes, wide nostrils, eyes full and mild. The skin should be soft to the touch with fine silky hair. I like to see an animal active, but not wild.

Before closing I wish to give a word of warning to those who are breeding for beef,—never let an animal get down poor, not even from birth. An animal that has been neglected and allowed to get down poor will not only have lost six months of its life, but it will never attain the same perfection as it would have, had it been kept in thrifty condition from the start.

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## SELECTION OF BEEF CATTLE.

BY GAVIN BARBOUR, CROSSHILL.

In this article I will deal chiefly with the selection of cattle for feeding purposes. Success in beef production depends so largely upon selection that it requires close observation and a great deal of study to become expert in this. To know the characteristics of a good animal, in theory, is not enough we must be able to make use of that theory in practical selection. The greater the proficiency in selection, the higher will be the profits realized.

In selecting a bunch of feeders from a large herd, we cannot take time to examine each animal closely, but we should be able to take in the general appearance at a glance, and know whether or not an animal is a good feeder, from some distance take a side view of the animals as they pass you, for the reason that we notice in a great many animals, a good depth of front. Now this is not objectionable so long as it does not show coarseness, but we must see that this depth of body is carried right back. Good doers must have

depth and thickness of heart, equal depth of flank, a well sprung rib, giving capacity for food, width of loin coming full to the hooks, with width evenly from hooks forward. The hooks should be set wide apart, a little low in preference to too high, showing smoothness. This width should extend to pin bones and carry down as far as possible. This confirmation of body, set on short legs, with neck vein blending nicely into the shoulder, having a properly formed head and good eye is what we might call a well balanced bullock, and one which will be profitable to the feeder, dealer and butcher.

Our selection should also be uniform in size and type, and if I would not be counted extreme. I would say in color. However, this is generally impracticable. Some will say, if we have good individuals, what does it matter whether they are uniform or not. But the general appearance of your bunch will help you in selling. First impressions are lasting. If you can show a dealer ten or twenty cattle standing in a row, one in size, type, and quality, without a cull, it will mean at least twenty-five cents per hundred pounds for your care in selection.

The best always bring a premium in the market, while the inferior are not wanted. How unsightly it is to have in your stable a general mixture of all breeds and sizes. Even if you have just one or two poor ones, the dealer will pick them out and want to buy the good ones at the value of the poorer ones. So you see it pays to have cattle of uniform type, size and quality.

Whether we should select heavy or light cattle matters not so much. Decide as to what time you will market. Select and feed accordingly. Suffice it to say, the short keep steer that requires 100 to 150 pounds to finish him is worth 50 cents per hundred pounds more than the long keep fellow that requires a 300 pound gain to finish him.

I have indicated the type we want. Now as to the type we do not want, we must discriminate against dairy class because they place the fat upon the internal organs where it is of comparatively little value,—the dairy type for dairy products, but the beef type for beef production.

In conclusion, let me say, select early, select the best, select the low down, blocky, thick-fleshed, early-maturing sort that distribute the flesh evenly over all parts of the body. When you have done this you have taken the first and perhaps most important step in the direction of profitable beef production.

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## FOWLS A NECESSARY EQUIPMENT FOR THE FARMER.

BY J. W. CLARK, CAINSVILLE.

Poultry raising is becoming one of the leading branches on the Ontario farms to-day. The demand is increasing year by year. Our own markets are able to consume nearly all the eggs and dressed poultry we produce. The great west is asking for large shipments of both eggs and dressed poultry, many orders of car lots were refused last year on account of the shortage in supply of fattened birds. Our export trade to Great Britain is very small and can be greatly increased if the farmers will raise more poultry of the proper breeds and type and finish them before they are put on the market. Far too many farmers are paying little or no attention to the kinds of poultry they have, and send them off to market without fattening at all; and they get a low price because the birds are thin, and then say poultry does not pay. Far too much of this class of poultry is put on our markets every year, and



the prices realized for them are not profitable, and the demand for this grade of stuff is limited, when on the other hand good prices have been paid for properly finished birds. From 14 to 16 cents was paid in Toronto and Montreal in 1906 and 1907 for fattened chickens.

Mr. W. R. Graham, of the Ontario Agricultural College, Guelph, tells us that from experiments at the College it does not cost any more to produce a pound of chicken than a pound of beef or pork, and not nearly as much where they have free range of the fields after the harvest is off. The farmer can raise chickens much more cheaply than any one else if he has proper equipment for handling them.

A farmer should endeavor to keep at least 100 hens of some good utility breed, such as Rocks, Wyandottes, Orpingtons or Rhode Island Reds. He should pay special attention to selecting the proper type, low set, full breasted birds. For 100 hens he would require a building 12 x 50 or 6 ft. square to each hen. It is not necessary to put up very expensive buildings. A comfortable, moderately warm building, well ventilated, free from any dampness is all that is required for winter use. The floor should be kept covered with dry leaves or straw to force the hens to exercise during the cold weather. A great deal of labor can be saved in feeding if the hopper system of feeding is adopted. I have had good results by feeding a dry mash in large hoppers that will hold from 1 to 2 bushels. This dry mash is before the hens at all times, and is made up as follows, 35 per cent. bran (by measure), 20 per cent. oat chop, 20 per cent. corn chop, 10 per cent. ground alfalfa, 10 per cent. beef scrap, 5 per cent. oil cakes. To induce exercise, wheat is scattered in the litter at night and covered up. So the hens will exercise early in the morning. They will keep busy for many hours hunting out the grain as they like it much better than the dry mash. A mangel or sugar beet should be given to them each day to pick at during the winter. Each spring the house should be whitewashed, using a little crude carbolic acid in the wash as a disinfectant.

If time will permit everyone who can should use the trap nests and keep a record of his flock. By this method you can find out the unprofitable ones that are only boarders, and by using the best layers to raise stock from, a good laying strain can be bred from any variety. Hens are much like dairy cows as producers. If you have a good laying strain kept in suitable buildings and fed properly they will return a handsome profit.

**FIGHTING VERMIN.** Nearly every farmer is troubled more or less with lice or mites during the summer months; the nests and perches are the chief breeding grounds for such. A good plan is to discard all straw or litter from the nests and use either tobacco stems or cedar boughs for nest material. A farmer could easily sow enough seed to raise sufficient tobacco in the garden for this purpose. A good plan is to paint the perches with coal-tar during the summer, this will fill up any cracks or chinks in them which harbor vermin. Go over the perches once a week with liquid from steamed tobacco, or coal-oil during the warm weather. Keep all droppings cleaned out regularly and your poultry house will be free from lice.

A great many poultry men to-day are using small colony houses 8 x 10 ft. square for summer use. From 10 to 15 birds are placed in these buildings early in spring as soon as the snow is off. These buildings are built on runners and can be hauled out in an orchard where the hens have free range with plenty of shade.

After the breeding season is over all males should be killed or confined away from the hens. In most cases it will pay better to kill than to keep

over as it will cost about \$1.25 for feed till he is wanted again. I find a good, vigorous cockerel will give a much higher percentage of fertile eggs than a cock bird. It is a common practice of allowing the males to run with the hens all summer. But unfertile eggs will keep much longer than fertile ones, for where there is germ life there will follow decay. The germ of an egg will start to develop in from 70 to 80 deg. and when the temperature goes down it dies and the egg soon loses its flavour, and if kept any length of time is undesirable and unfit for food. Hens that are fed regularly on grain produce eggs of much better flavour than where they are forced to pick their own food.

**RAISING YOUNG CHICKENS.** Nearly every farmer has an incubator for hatching. Some have been successful while others have made a total failure of them. Hatching by artificial methods is being carefully investigated by Mr. Graham, and Mr. W. H. Day, at the Ontario Agricultural College. We hope they will solve the problem in the near future. Those who wish to get out a lot of early pullets for winter laying have to depend on the incubator



First Prize and Sweepstakes at Winter Fair, Guelph, 1906.

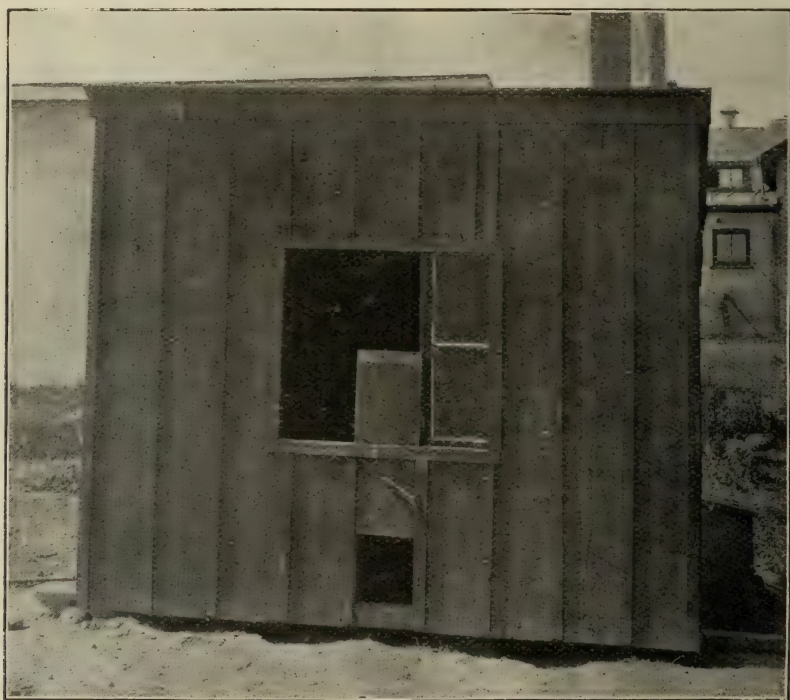
in most cases for the work. I have found that when plenty of moisture was used the chicks hatch much stronger and are more easily raised. I have been using milk (skim) heated to 180 deg. and when cooled down to 100 deg. a teaspoonfull of starch (pure culture) is added; this is put in pans below the eggs in incubator. It is necessary to replace this every 4 or 5 days. Take the milk out when the hatch is due. I have found that just as good results are obtained by only turning the eggs from the 4th to the 17th days of incubation. Where a farmer has the breeds mentioned above, and has sufficient brooding hens, he will have as good if not better results from them than with incubators. The chicks hatched with hens are much more easily raised.

**BROODERS.** I have found that brooders require far too much labor, and expense in coal-oil to heat, and have used the hens for brooding chicks hatched in incubators, placing 2 or 3 eggs under sufficient brooding hens, just before the chicks are due to hatch and the hens will mother from 15 to 25 of the chicks, depending on the season. After the chicks are old enough to do without brooding they are placed in colony houses, out in the orchard about 50 to 75 in each house, and are fed from hoppers where grain is kept before them at all times. These hoppers save a lot of labor in feeding. They should be made large enough to hold two bushels of grain. Cracked corn and wheat mixed makes a very good ration. A small hopper of beef scrap should



be placed nearby to supply animal food when required. Large drinking fountains holding 6 or 8 gallons should be provided. These can be filled and hauled out on a stone boat and will last several days. Chickens raised where they have free range and plenty of feed and water mature quickly and make good, strong breeding stock.

**THE USES OF COLONY HOUSES.** As soon as the grain is cleared from the fields, close the houses at night, hook a horse on the colony house in the morning and haul out to the field. The chickens will find plenty of feed for several weeks, saving a lot of expense in feeding. As soon as they have reached the weight of 4 or 5 lbs. all the surplus stock should be put in fattening crates to finish for market. See that they are free from vermin before placing them in crates. They should be starved for 24 hours then fed sparingly for three or four days till they get accustomed to food.



A Movable Colony house with a Universal Hover attached.

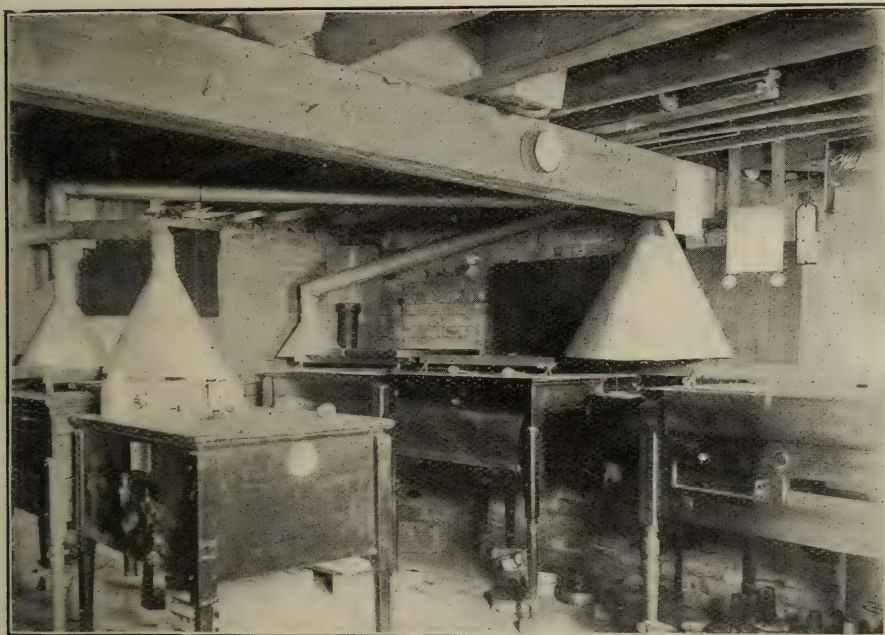
For fattening, a ration composed of finely ground oats, barley and buckwheat mixed with skim milk makes a good fattening food. Supply water once a day, and grit twice a week. They should be fit to market in from three to five weeks.

#### POULTRY RAISING AT HILLSIDE FARM.

Hillside Farm lies about a mile or so north of the City of Toronto limits and is owned and operated by Mr. L. H. Baldwin. The success which he has attained and the health and vigor of his flock make the study of his methods quite interesting. Apart from an intense personal interest in fowl, with

judicious care and study of their requirements, the keynote of his success is perhaps sounded in "Fresh Air and Sunshine."

Beginning with incubation, the proprietor states that there is undoubtedly much to learn in artificial methods. Probably much of the failure to make poultry farming an assured success can be attributed to improper methods of artificial incubation. Too many chicks "dead in the shell" and too high a mortality with those that hatch out is, in Mr. Baldwin's opinion, attributable to improper development during the period of incubation. Lack of stamina and vigor in breeding stock must be taken into consideration, but in all probability this condition began in the parent stock at the time of their incubation. Of course, debility often arises from improper housing, care and feeding of breeding stock, especially during the winter months.



Interior of Incubator Room, showing method of ventilation. The dark pipe, of which there are four—one in each corner,—supplies fresh air from outside. The foul air from the lamps is collected in cones and carried to one large pipe over the largest cone. Three of Dr. Wagner's "Inova" incubator thermometers (used extensively by Mr. Baldwin) are seen on top of two incubators. The racks on the incubators are used for testing the eggs when cooling and turning them.

Incubators vary considerably—even machines of the same make. However, from personal experience, Mr. Baldwin inclines to favor the "radiant" machines rather than the "diffusive," believing that something may be learnt from Chinese methods of incubation which provide absolutely no ventilation except when the eggs are taken out of the ovens for turning or cooling. The Chinese usually secure a sixty to seventy per cent. hatch, while our averages range from forty to fifty per cent. with chicks not nearly so healthy as theirs. By way of further explanation, we are referred to Prof. Graham's test of the atmosphere under setting hens, indicating a high percentage of carbon dioxide, which condition obtains throughout the hatching period.



A high percentage of carbon dioxide is retained in the lungs of the human even after exhalation, for in breathing the lungs are not entirely emptied. If an attempt is made to force the breathing, or to breathe rapidly, the head becomes dizzy from an excess of oxygen, which is also the case in high mountain climbing. Now, if too much ventilation is allowed in the incubator, especially by the diffusive system, an over amount of oxygen may be supplied which probably accounts for much abnormal development in the chicks.

The proprietor explained that, after comparing his records for several years back, he prefers radiant heating machines to those employing the diffusive system. The natural hatch with the hen sitting on the eggs is an example of radiant heating.

Referring to "The Prairie State," the following experiment was related: As radiant heat is desirable, particularly for the first half of the hatch—diffusive heat giving too much ventilation, too much oxygen—the ventilation was shut off completely and only radiant heat applied for the first ten days. Water was placed in the machine from the first. Mr. Baldwin thinks this may count very materially towards the vitality of the chicks, and from his experiments this season, better results were obtained by using moisture. A tray of sand was placed in the bottom of the machine. This was kept moist continually. The eggs were placed in a metal tray lined with strong brown paper, and on the 11th day (after testing), the eggs were removed from the metal tray to the ordinary open tray and allowed to remain on the open tray for the remainder of the hatch. The sand tray was removed on the 13th day, and after that, no moisture was applied. The results were most encouraging, there being not only a high percentage hatch, but the chicks were fine, vigorous and well developed.

As Mr. Baldwin expressed it, "One swallow does not make a summer," but while not claiming that the results were conclusive, as they obtained only in one hatch, still, he feels confident that moisture is helpful throughout the first ten days and that during that period, excessive ventilation should be avoided, indeed he thinks that perhaps it is as well to have no ventilation. After the first ten days, the ventilation should be gradually increased until the 16th day, when full ventilation may be allowed.

This Poultryman has experimented by placing the eggs in closed trays and covering them with a loose piece of flannel, maintaining a temperature of about 101 degrees internal heat, the flannel covering being removed only when turning the eggs and kept in place until the eleventh day, after which it is removed and the eggs exposed to the ordinary conditions of the incubator. It is believed that this materially aids in the production of vigorous chicks. However, there is one difficulty with this, in the ordinary incubator—a uniform temperature is not maintained throughout the egg chamber.

The temperature of the centre of the egg as taken by an egg thermometer, should, in the opinion of the proprietor, be 100 to 101 degrees. During the first twenty-four hours he likes to expose the eggs to a fairly high temperature and afterwards reduce it a little. In fact, he recommends a rather high temperature during the first four days of the hatch. In this way, the germ gets a vigorous start, then being retarded by a lower temperature in order to prevent a premature hatch, much more favorable results obtain.

The incubator room was ventilated by four "U" shaped drain pipes (6 inch) which were free from two to three feet in the air outside, and five feet inside the room. These introduced plenty of fresh air, while large galvanized sheet iron funnels over the lamps, collected the foul air from in-

cubators and lamps, into tubes which ran through a large pipe into the open air, thus producing a most admirable system of ventilation.

In contrast with this effective method, Mr. Brown who a short time ago, toured through the United States and Canada in the British poultry interests, remarked upon the general lack of any attempt at systematic ventilation of incubator rooms. The above is a unique system which is quite consistent with the "fresh air" system for poultry.

There are numerous makes and plans of brooders, but generally speaking these may be classified as bottom heaters and overhead heaters. The "Peep of Day" Brooder is a good example of bottom heating machine. In the overhead heating system, metal drums contain the hot fumes from the lamps. Mr. Baldwin has adhered closely to bottom heating machines and has devised a brooder or hover chamber which enables him to adjust the brooder to various conditions of outside temperature and to the varying ages of the chicks. In his opinion, the main essential of a brooder is that it should be snug and the condition of the chicks at all times as comfortable as possible. The floor of the hover chamber should be about on a level with the ground and the brooder made to face as nearly south as possible.

The chicks are removed from the incubators to the brooders the evening of the day after they are due to hatch, that is to say, the chicks will generally hatch on the afternoon of the twentieth day, and the hatch will be complete on the morning of the 21st, then on the next afternoon they are removed to the brooders and for that night are closed in the hover chamber.

The next day they are allowed out from under the hover for a run in the morning without being fed, but care is taken to close them in again to prevent any danger of their bunching outside of the hover. The attention necessary to see to this depends greatly on the weather conditions. On a bright sunny day, they are much more likely to bunch outside, attracted by the sun, when they may be chilled by a cold wind, whereas on a cloudy day the same thing would not happen.

As soon as the chicks appear hungry they are ready for food—finely cracked wheat and corn, ground, broken shredded wheat biscuits, mixed in about equal quantities, with a little fine chick grit added. They should be fed sparingly until they develop a fairly good appetite and then given a mash made of the same material moistened with raw eggs, the raw eggs being broken shell and all into the mash and this thoroughly mixed to produce a fairly dry mash which is fed the chicks scantily at first but more frequently as their appetite develops. Later on they should be given this feed twice a day; the last feed at night being rather over fed with the idea that what may be left will constitute their first feed early in the morning and may be secured as soon as they come out from under the hover. The feeding of the mash during the morning between 10 and 11 and again in the afternoon between two or three o'clock is governed by the appearance of what food may be left from the earlier dry feeding, that is to say, if the chicks appear to leave any of the dry feed, the feeding of the mash is skipped until their appetite again appears to be equal to another meal. When the chicks are from a week to ten days old, some small wheat is given them in the evening, as soon as it is seen that they eat it readily, whole wheat is made the full evening meal.

In order to properly regulate the lamps in the various brooders, Mr. Baldwin has a small red flag hoisted at the side of each brooder. In this way, each lamp receives the special attention it requires. If a brooder is getting too much feed or any other change is necessary, the flag is moved



from the side where it is hoisted, to the middle of the top of the brooder, thus indicating where special care is necessary, and in this way the brooder is sure to get it.

His idea is to have the young chicks as snug and comfortable as possible, judging the temperature of the brooder by the appearance of the chicks, that is to say, if the chicks appear to crowd together in some particular part of the machine, the conclusion is that they are not warm enough, and the lamp should be turned on or more covers applied to the hover. On the other hand, if the chicks spread to the outer parts of the hover, thus indicating that they are too warm, the blaze of the lamp should be reduced or some of the coverings of the hover removed. However, the aim should always be to retain a fairly high temperature in the centre of the hover so that any chicks that may not have the vitality of the others and consequently look

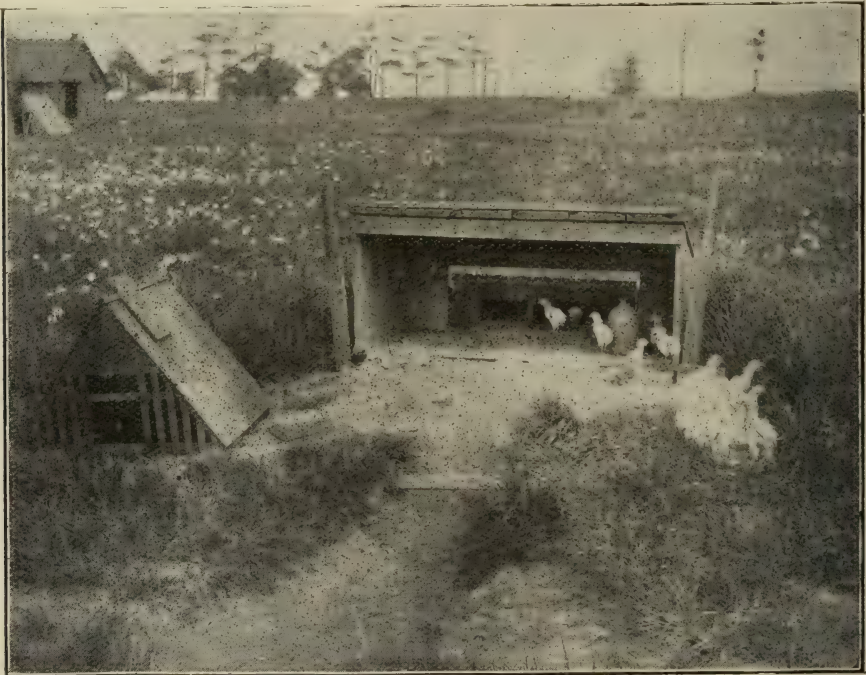


FIG. 1.—Brooder and Brooder Coop in position with wire netting. Also “A” Coop ready to be used by the chicks in place of the Brooder.

for more heat, may find a spot congenial to them, while the more vigorous chicks will push out into the wings of the hover where they find the temperature adapted to their requirements.

The lamps are maintained in the brooders for three to five weeks depending upon the period of the year and the condition of the weather. Just as soon as the chicks appear to find the heat oppressive, the lamps are put out, but before the lamps are out, the coverings of the hover are removed and the hover itself, leaving the hover chamber entirely open. After the lamps are out for a few days the division between the hover chamber and the front of the brooder is removed, leaving the brooder simply an open shed, which gradually hardens the chicks so that they may be ready to occupy the “A” coops (Figure 1), which are placed instead of the brooder itself which is removed, so that the chicks returning in the evening, enter

the "A" coop instead of the brooder and these coops are afterwards removed each day their own width. The chicks occupy the "A" coops for another six weeks, when the roosting coop is put in place of the "A" coop and likewise is removed each day its own width, the chicks occupying it for the rest of the season. (Fig. 2.)

Young chicks in the brooder should be made to take a morning siesta of one and a half to two hours every day, from 11 a. m. to 1 p. m., as during that time the sun's hot rays do them more damage than at any other time.

When there is still danger of snow, the brooders are placed inside a Brooder House or in "wigwams" made 8 feet square at the base and with a ridge roof. The chicks that are placed in the outside brooders after they have been removed to the "A" coops and later on, to the roosting coops, may gradually be moved towards one of the "wigwams". At the age of three months the cockerels are separated from the pullets and their place in the



FIG. 2—"Wigwam" with "A" Coop inside. The Brooder just removed from the "Wigwam" stands to the left, and to the right of the picture is seen one of the Roosting Coops for chicks when 12 weeks old.

wigwam is made up by the chicks that come from the out door brooders moved towards the wigwam. In this way each wigwam is comfortably filled with chicks of fairly even size, each wigwam accommodating from 30 to 40 pullets for the rest of the season.

In front of each brooder coop and also in front of the wigwam is a small yard about 10 feet in diameter, enclosed with a wire fence of inch meshing about two feet wide. This is supported by ordinary builders' laths driven into the ground with the edge to the wire netting, care being taken to fit the wire closely to the ground in order that the chicks may be kept within the enclosure until they are old enough to be allowed their freedom, which is generally attained at the age of three to five weeks, but much depends upon the individual flocks and weather conditions.



The wigwams and outdoor brooders are placed about 100 feet apart so as to avoid any danger of flocks intermixing. At the time they have attained the age of three weeks, they have become so well located that in most cases they will return to their own brooder no matter how far they may roam in search of food. At the first, each flock is fed immediately in front of their own coop, but as they grow and wander, the feeding boards are concentrated at local centres and the birds fed in rather larger flocks. The mash is fed on boards in long lines (Fig. 6), and care is taken to provide ample board accommodation for each flock, more feeding boards being added if the fowls are in any way crowded. The whole grain feed at night is scattered in the grass about the feeding boards. Constant feeding of the chicks will wear down the grass, but the grain is then thrown farther out and thus the feeding ground is ever widened.

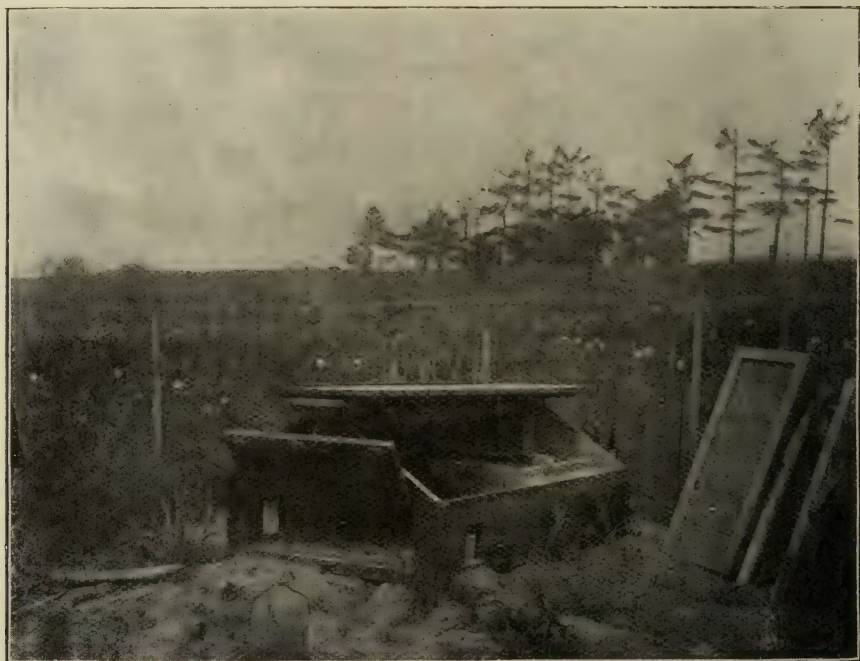


FIG. 3—1907 Brooder showing the easterly half of roof open. The hover cover and one blanket stand to the right. The wooden lid of the hover chamber can be seen in the rear compartment of the brooder. The two side doors should be made nearly the full width of the front chamber, and not as in the photo. These doors should have a wire screen on the inside and a sliding door on the outside to close it up.

During the summer, after the cockerels are three months old, they should be removed to yards by themselves. Birds that do not give promise of being of sufficient value for breeding purposes, should be at once marketed. These sell readily and at good prices, as soft roasters. During the month of September; a general round up of the pullets is made. A careful culling takes place and all the vigorous and well developed pullets are then removed to their winter quarters so that they may if possible become accustomed to them before they commence to lay. When this is done, and they begin to lay in the fall, it is likely that they will continue to lay all the winter.

The chicks always have free access to drinking fountains and to feed hoppers. These feed hoppers are about three feet high and a little better than 12 inches square, having two sections which contain, on the one side, corn, wheat, broken shredded wheat biscuit, barley and ground meals, and on the other side meat meal. The fowl may at any time get this feed through an opening at the bottom, covered with fine wire screening.

The 1907 plan of brooder which Mr. Baldwin has designed, aims at providing snug conditions for the young chicks. As in other brooders, the lamp chamber is under ground, a drain being dug immediately in the rear to protect the lamp chamber from flooding in case of heavy rains. By means of a double opening roof, the operator is enabled to open up the brooder on the lee side, that is, with a strong east wind, he will open up the west half of the roof, and vice versa with a strong west wind. The south end of the brooder can be either opened or closed. In case of a strong south wind which will seriously affect the temperature of the brooder, the south is kept closed.

The hover floor should be about on a level with the ground, and the brooder should face the south. The construction of the hover is on the "bed" principle—that is to say, it enables the poultryman to add "blankets" and "comforters" as weather conditions demand or the age of the chicks requires. Various blankets are used. The first is made of canvas and flannel, stretched tightly on a light wooden frame, while the second is of grey flannel (Fig. 3), with slashed edges, which hang down to the floor of the hover. In very cold weather several thicknesses of newspaper may be piled on the other blankets, and these give a wonderful degree of comfort and warmth. A light wooden cover may be used in addition to the regular hover lid. (See Fig. 3.) These coverings may be removed from time to time to keep the chicks always comfortable, and, if the weather permits, one week after the coverings have been taken out, the lamp may be allowed to go out.

In preparation for the winter work the stock of the previous year is carefully culled, and any birds that have shown weakness of constitution in any way are removed, and only the most vigorous of the flock retained for winter layers and breeders. During the period of the moult all yearling birds are fed freely with meat, either by freshly cut green bone or by meat meal, fed in mash or dry in hoppers. Many have suggested the possibility of forcing the moult in yearling stock, but little good is gained by so doing.

If the flock are in fairly healthy condition they will moult naturally, at the proper season of the year. After the moult is over, and the growth of feathers fairly well completed, care is taken to see that the flock do not become over-fat by too heavy feeding, and the same care is taken with the pullets, not to feed too heavily at first, to force egg laying, but rather to allow both the old stock and the pullets to attain their development in ordinary course and enter into the laying period in the best possible condition. When laying has commenced the feeding is increased to meet the demand for egg production.

As soon as fall weather breaks and the birds are confined more to the henhouses, plenty of straw is kept on the floor of the henhouses, and in this grain is thrown to encourage the birds to exercise by scratching. During the winter a fresh supply of straw is added whenever it appears necessary. This straw and whatever soil may appear to be contaminated with the droppings of the birds is all cleaned out during the month of July, and fresh soil placed in the henhouse. This will thoroughly dry out before the fall of the year and the time again comes to distribute fresh straw.



During the winter mangles are supplied to the birds continuously by placing them on nails in the wall of the henhouse and slicing one side of the skin. After the mangle has a starting point, the birds will pick out the interior. Water is supplied to the flock in basins placed on a level with the dropping board, and in this way it is kept out of the scratching material of the henhouse. (See Fig. 5.) As soon as the snow comes and the water in the bowls freezes, the birds being allowed free access to the snow, no more water is supplied, and they freely eat the snow in its place.

Care is taken to give the henhouse a thorough airing every day, and in the very coldest weather, with the thermometer well below zero, the windows will be opened for an hour or more, unless there are stormy conditions at the time. The thorough airing each day keeps the henhouse dry, and there is no difficulty with moisture coming from the frost collecting on the walls of the house.

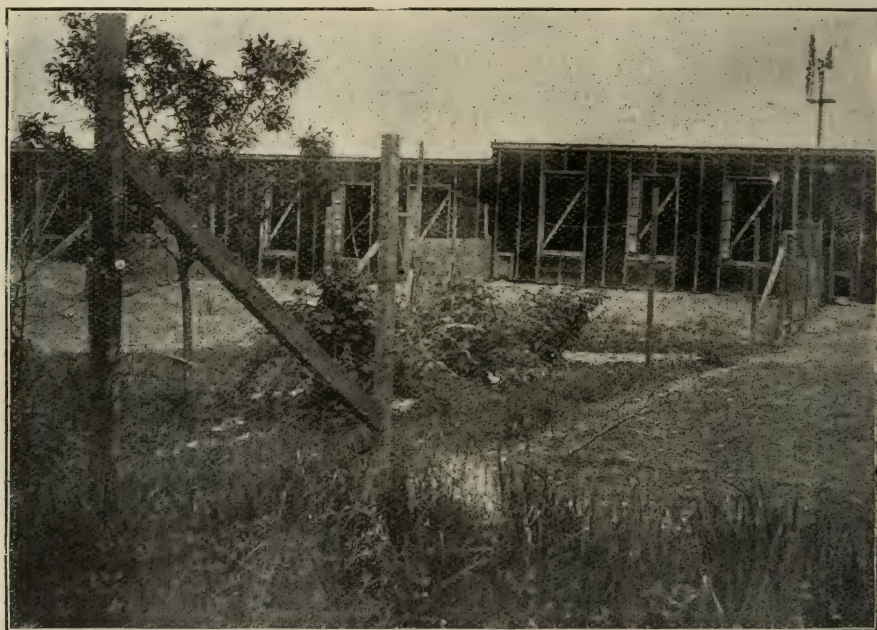


FIG. 4—Quarters for laying birds, showing yards.

Mr. Baldwin started with the *scratching shed henhouse*, which was first introduced in this continent by Mr. A. F. Hunter. Its aim was to supply poultry with ample fresh air and scratching room by use of an open shed, protected by curtain screens against the wind and rain. In ordinary weather these screens were left open, exposing the fowls to the open air. This henhouse worked to advantage, but rather increased labor by the care necessary in raising or lowering the curtain screens during changeable weather. Just in front of the scratching shed henhouses a strip of artichokes were growing as shade for the fowl. When autumn comes a tidy little income will be derived from this succulent vegetable.

The *scratching room henhouse* (see Fig. 4) was then tried. This was designed by Dr. Woods of the "Reliable Poultry Journal." It combines the useful features of the scratching shed plan with more economy in management. These henhouses are constructed on the plan of continuous pens,

each pen being 12 feet deep and 20 feet wide and accommodating 30 to 40 hens. It has been suggested that it would be an advantage to have these pens rather deeper, so as to move the roost further away from the window. Pens 14 to 16 feet square might be considered well adapted for the purpose. The scratching room henhouse practically throws the scratching shed and roosting room of the old plan into one room.

The roof slopes from the south to the north. The south wall is  $7\frac{1}{2}$  feet high and the north  $5\frac{1}{2}$ . Many poultry raisers prefer a ridge roof, making the side walls about six feet high and filling the roof space with straw, which, no doubt, has much in its favor. The interior of the north wall and the roof are sheathed with tongue and grooved sheeting lumber. Earth floors are used to avoid harboring rats. Occasionally, however, they get in under the

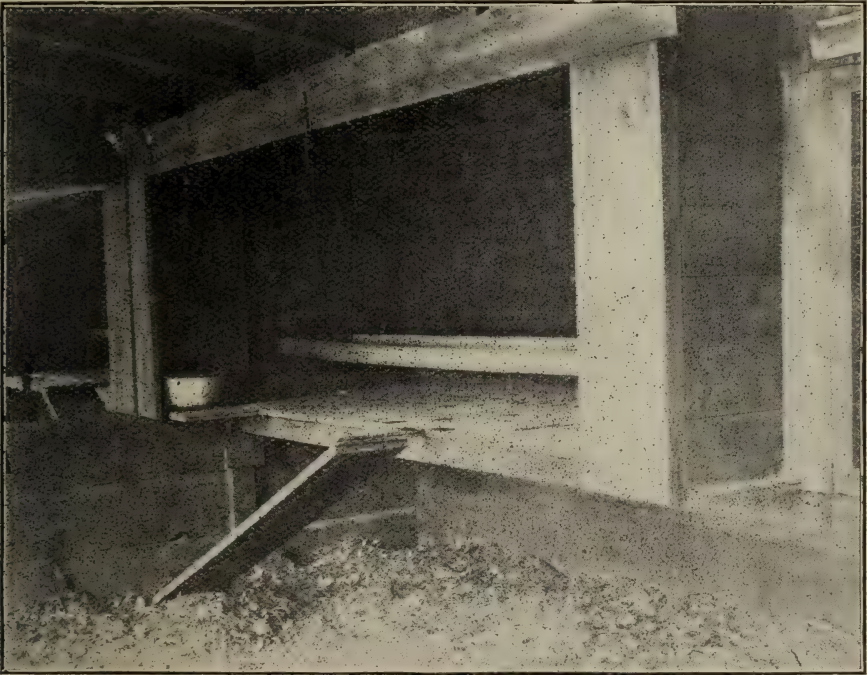


FIG. 5—Showing interior of pen, particularly the roosting quarters, and situation of drinking bowl. The edge of the coop for extra males is seen in the very right of the photo.

north wall, but in Mr. Baldwin's own words, "We just dig them out and let our fox terrier finish them."

The foundation of the house is made of 6x4 material, supported by fair-sized stones. On this foundation the studding rests with cross pieces, extending from the south sill to the north sill at the division between each pen. The frame is covered with inch lumber, and this is again covered with ruberoid roofing. Special care is taken to cement the roofing, particularly at the point where the roof connects with the north wall, so as to prevent all possible chance of draft on the birds on the roost.

The windows in the south wall are 5 feet by 3 feet, with ten by twelve-inch glasses (twelve panes). The window frames should be made to slide from side to side and a space left open on top of the window frame, so that it may be raised in the event of ice collecting at the bottom. Inside



each window is a wire frame screen, with inch meshing, which keeps the sparrows out as well as retains the birds when required within the pens. The henhouse has two wings and six pens in each. There is also a central feed room eight feet wide, which is useful in keeping the supply of grain, as well as making a coop for individual birds when necessary. One wing has individual runs for the pens, to be used for breeding purposes, but the other wing has one large run in common, which is quite sufficient where one does not wish to particularize in hatching eggs from individual pens. In each fence between the runs, and beginning at the henhouse, is a sliding gate, through which a wagon can pass when the henhouse is cleaned in July.



FIG. 6—Showing interior of one wing. The section of the pen showing place for nests, coop for extra males, and roosting quarters can easily be seen. Notice the cross partitions boarded close at the bottom with wire netting above. The doors at the left of the partition have double acting spring hinges so that they will swing either way.

Along the north wall of the interior of the henhouse a shelf is run three feet wide and about two and one-half feet from the floor. (See Figs. 5 and 6.) One half of this in each pen is used as a dropping board under the roosts (which have wide boards leading up to them), and the other half is divided into first a coop five feet wide, which, if necessary, may be divided again into two coops, where extra males may be kept, and where brooding hens from each pen are placed with an extra male, to stop their brooding condition. (Fig. 6.) The remaining portion of the shelf is used for the nests, which are placed in two tiers of three each, the upper tier being somewhat narrower than the lower. (Fig. 6.) The nests, being each about eighteen inches square, afford ample accommodation for the birds in the pen. Two or three hens will occupy the same nest, apparently in preference to individual compartments. This arrangement can be adapted to a system of trap nests. A careful record is kept of the number of eggs produced each

day in each pen. The coops are supplied with neat little hinged boxes, containing crystal grit—a preparation composed of broken granite—in the one side and broken oyster shells (lime) in the other.

In the runs in front of the henhouses were planted raspberry bushes for immediate shade; also plum trees, which are probably the best fruit to grow in hen yards, as the hens eat the curculio which destroy the plum. (See Fig. 4.)

With regard to the diseases of poultry this poultryman considers it not worth while to spend much time in doctoring sick chickens beyond the simple remedies for colds and the necessary precautions for fighting insect pests. If birds are subject to diseases of serious consequences the sooner they are disposed of the better. At times, especially in the fall of the year, after the



FIG. 7.—Three months' old chicks feeding on boards in front of Brooder House.

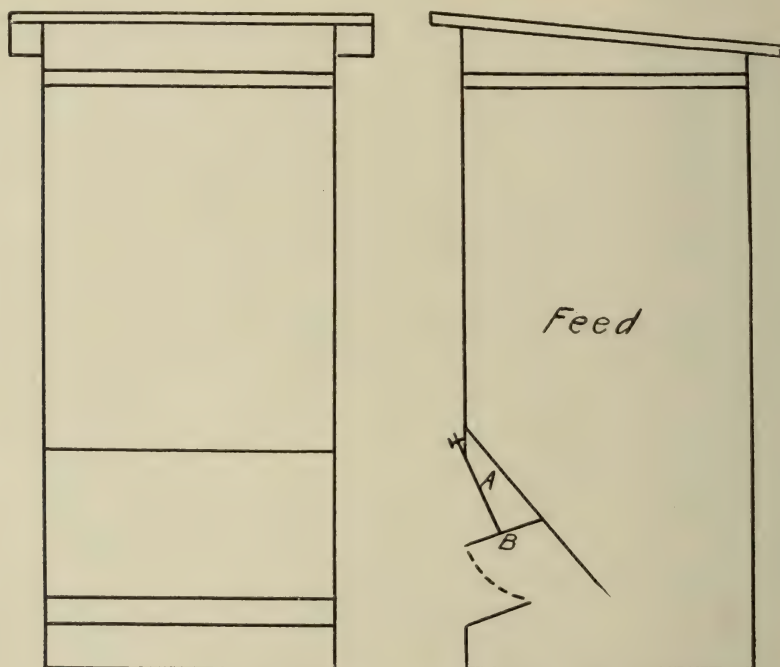
birds have been brought in from the outside coops to the henhouses, there is considerable danger of influenza colds, which, if not checked, may develop into serious attacks of roup. These colds will develop from drafty conditions, and may occur by leaving the windows open too much on a windy night when the wind comes in such direction as to blow directly on the roosts. If there appears any intimation of influenza through the flock, which will show itself by constant sneezing or slight running at the nose and eyes, zenoleum is used as a spray, and applied at night over the birds when on the roosts. If cases of cold do not respond to the treatment, and show evidence of growing worse, this is taken as a weakness of constitution, and the birds are moved from the flock as being undesirable.

Active birds, with free access to good dusting facilities, will keep themselves free from lice, provided a little care is taken to apply coal oil or some insecticide to the roosts and roof.



## SUGGESTIONS FOR POULTRY RAISING ON THE AVERAGE ONTARIO FARM.

About the middle of March set the incubator going so as to produce chicks about the first week of April. Put any brooding hens on china eggs till the chicks are hatched; then transfer the chicks to the care of the hens. Any that may not have such care must go into the brooder. This method will reduce much of the care and attention that the chicks require during the busy season, and this part of the work—care of the brooder—is the most trying and exacting of any work connected with poultry raising. Farmers should pay more attention to increasing vigor and productiveness in their stock rather than to go into it more extensively.



Improved feed hopper. 12 in. x 12 in. x 24 in.

- A. String to raise lid or to close it when not required.
- B. Metal lid adjustable to size of chicks.

In adopting any of the up-to-date methods discussed in this article, they should make use of any available space which may not now be used, or which may at the present time be used for poultry, provided these spaces are suitable. There is no better place for a hen to spend the winter than around the barnyard, but several things should be considered in adapting these places for henhouses, amongst which may be mentioned cleanliness, dryness, freedom from drafts, and plenty of fresh air. It is also necessary to allow fowl to secure plenty of exercise and plenty of suitable dusting facilities.

## GROWING EARLY VEGETABLES FOR COMMERCIAL PURPOSES.

By E. E. ADAMS, LEAMINGTON, ONT.

In the Province of Ontario this question is being discussed more and more during each succeeding year. Some years ago some persons in different parts of the Province conceived the idea that possibly with the increase in population this line of business, if taken up and given strict and careful attention, might be made to pay and prove of value to others. The idea has worked wonders. In a great many parts of the Province we find men who are devoting their whole time and energies to the production of different varieties of vegetables for home market, as well as for shipping purposes. Not only do we find this in our own country, but the idea seems to have taken root in many places—in Colorado, Florida, Texas, and other parts of the United States, and when we read of the results attained in these places in such a few years we are constrained to put forth greater efforts for the extension of the business in our own Province. We read of some men growing a field of eighty-five acres of crookneck squashes, 300 acres of early potatoes, 250 acres of cantaloupes, fifteen acres of peppers, and so on, and this means that there must be something in it or these men would not continue in the business from year to year.

Of course, the great question is that of sufficient market. Ontario can use a very large quantity of vegetables. There is a large quantity grown. The distribution is not along correct lines, from the fact that too much stuff is sent to some markets while others are receiving none. Many growers consign all they grow to commission men, and in consequence do not net as much at the end of the season as those do who handle their produce on different lines. We find here that it pays better to sell our produce f.o.b. Leamington than to send it all over the country promiscuously to be sold for any price that it will bring.

This brings up the question of co-operation. The selling of this produce is of most vital importance to the grower, but most of them as yet do not appear to appreciate this part of the question at its value. This will work out in time, and no doubt growers will then receive for their produce a fair and reasonable price, which is not always the case under present methods.

In this locality we grow early cabbage, tomatoes, wax beans, peppers, melons, cucumbers, sweet corn, peas, onions, and lettuce for shipping purposes. Cabbage seed is sown under glass about March 1, and when large enough is transplanted to beds or flats, giving it a space of three by three inches, carefully watered once a week with manure water and at other times with clear water. To give what I believe to be the best plants, I use in place of manure water a mixture of nitrate of soda and Peruvian guano, equal in quantity, three pounds to a barrel of water. Plants should be grown cool. If grown too warm they will run up slender. They should be kept down short, and will be much better for it. These are usually planted in the field in rows three feet apart and two feet in the row. Cut out from the beds or flats dividing the earth so that each plant can have as much attached to it as it had in the bed, say three by three inches. In planting in the field, a small garden trowel is used for making holes to set in. The soil for growing cabbage should be in the best possible condition, not only as to richness, but must have been well cultivated previous to planting, and while the crop is growing, in order to preserve as much moisture as possible. Some growers use Peruvian guano, sown broadcast at the rate of 1,000 pounds per acre, and 100 pounds of muriate of potash, well worked in before



planting. and from three to five hundred pounds of nitrate of soda is scattered around the plants at planting time and through the growing season. On sandy soil the soda has proven of great value in forcing this crop to maturity, and a much larger crop is the result from its use. The cabbage maggot is troublesome in some places, but has not been so here to any great extent as yet. In some places this pest ruins the crop, and must be taken care of when found. If the soil is removed around the plant, not enough to bare the roots, and a half-teaspoonful of bisulphide of carbon is poured in and covered with soil at once, the maggot will be put out of business. This treatment will save the crop, even though it appears to be quite a job to undertake with an acre or so, yet it will pay well.

Tomatoes are started March 1st, and in about three weeks are transplanted from seed bed to other beds and spaced about two by two inches, then moved again in about three weeks, then again in about two or three weeks, according as the plants require. Some growers transplant from seed bed to other beds, giving the plants about four by four inches space, and do not move again until they go to the field. Stronger plants can be made by moving at least twice. The soil in the hotbed or greenhouse for growing these should be reasonably rich. Well rotted stable manure or pulverized sheep manure can be mixed with the soil to enrich it. The soil in the field should be manured fairly well, but if a clover crop is turned under it will need no manure. There should be added to sandy soil 100 pounds of sulphate of potash, 300 pounds acid phosphate well worked in after plowing, and after plants are set 150 pounds of nitrate of soda should be scattered around the plants and well worked in with a fine-toothed cultivator. This will give the plants a good start, and result in earlier fruit. Some difference of opinion exists as to the distance apart to set plants. On my soil I find three and one-half by five feet quite satisfactory, while some growers plant four by four, and others four by six. Some believe that by setting stakes near the plant and tying them to it as they grow (training to a single stem) will give the best results, but while I have not adopted this method as yet, I purpose giving it a trial this season, as against the common method of growing them, to find out which plan will produce the finer fruit, quantity, earliness, etc. As soon as the plants are all in they should be cultivated and hoed as often and as carefully as possible. Some say cultivate once a week. My plan is to cultivate twice a week to force a fast growth, for the early crop is the one that pays. Shipping commences usually July 1st, and the early crop is all off about August 20th. Some later tomatoes are grown for canning, and also for supplying the northern sections of the Province and the west, but the price being then rather low, not many are growing for shipping, but prefer to sell to the canneries.

Cantaloupes are started about May 10th, under glass, either in pots or sods cut to four inches square. For my own use I prefer pots, on account of easy handling in planting in the field. These require good soil, both in the greenhouse and field. Well rotted manure mixed with the soil makes a satisfactory potting material. About a peck of manure to three pecks of good soil well mixed. When the plants have buds on them they are set in the field about June 7th. given constant and thorough cultivation, forced by being given an ounce of nitrate of soda sprinkled around the plant and hoed in, this being done as soon after setting as possible. Plants are set in the field in rows six feet apart and three to four feet in the row, each hill having only two plants. Good soil should be used to grow a crop of melons, that which has had clover plowed under or covered with eight or ten tons of manure and plowed in the previous fall. Either method is good, and the

best soil is a sandy loam. Melon plants should be sprayed with copper sulphate three pounds, paris green three ounces, and lime six pounds to a barrel of water for Striped Beetle, which destroys the plants, and sprayed once a week or every ten days with sulphate copper three pounds to a barrel of water, with six pounds of lime added to prevent blight. In shipping only well-matured melons should be put up. No smooth ones should be packed under any circumstances, as they have no flavor; but only those which are well netted should be shipped.

Cucumbers are given about the same treatment as melons, except they are started March 1st, and planted in the field, under cotton frames or beds, to prevent being whipped around by winds, and to assist growth. This is only used in growing early cucumbers.

Wax Beans, Sweet Corn, and Peas are planted as early in April or May as each sort can safely be put in the ground, and no special treatment is given them other than thorough and frequent cultivation to keep soil loose and open and force a quick growth.

Lettuce is grown in glass houses for shipment during early spring, and in early winter for Christmas trade. Not much is grown in January and February, as the cost of fuel is an item of expense that uses up all the profit for these two months. At the same time, the proper way would be to have plenty of glass so that a continuous crop can be grown throughout the season when there is no out-door-grown stuff, so that when customers are arranged for they can be sure of a full supply at all seasons. Stable manure and plenty of it, is used for fertilizing and nitrate of soda is given (2½ pounds to a barrel of water) once a week, other watering being done with clear water. About 10 weeks is required to grow a crop of Grand Rapids lettuce, this being the favorite variety. This is grown in a temperature of from 40 to 45 degrees at night, and from 10 to 15 degrees higher in the day time.

As to the profits in the business, that is a part that everyone will have to work out for themselves. During the growing season there is plenty work to be done, but when the marketing of the crop is on there is still plenty to take the attention. If growing entirely for shipping to commission men, attention must be given to finding out which is the best paying market when shipments are ready. This means the use of the telegraph or telephone. The expenditure of money for this purpose is money well spent, as the business can then be carried on intelligently as well as profitably. As before mentioned, I prefer selling at a price on board cars here.

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## THE FARMER'S FRUIT AND VEGETABLE GARDEN.

By E. E. ADAMS, LEAMINGTON.

Generally speaking, the garden is neglected to a more or less degree, other work being attended to first. To make a success of a garden requires time, attention, good soil and good cultivation. The almost universal practice is to have the fruit and vegetable garden combined: and the flower garden is sometimes combined with them. When the fruit and vegetable gardens are combined, the smaller and choicer fruit trees only should be admitted, such larger-growing trees as apples, pears, cherries, plums, etc., being relegated to the orchard.

Ground with a gentle incline towards the south is desirable for a garden. On such a slope good drainage can be secured, and the greatest



possible benefit is derived from the Sun's rays. It is well to have an open exposure towards the east and west, so that the garden may enjoy the full benefit of the morning and afternoon sun, but a shelter is desirable on the north, or in any direction from which the prevailing winds in the particular locality may happen to come. Good sandy loam is the best soil for gardening, although heavier soil may be brought up to a proper condition by manuring and cultivation. Wherever the soil is not quite suitable, but is capable of being made so, it is best to remedy the defect at the outset; and as it will be found easier to render a light soil sufficiently retentive than to make a tenacious clay sufficiently porous, a light soil is to be preferred to one which is very stiff and heavy.

In laying out the garden, the plan should be prepared in detail before commencing operations. The form should be square or oblong, since the working and cropping of the ground can be more easily carried out. Long straight rows of fruit or vegetables are easily cultivated, and much time is saved than where small square beds are used and have to be all hand worked. Good drainage must be given in all cases, (providing there is no natural drainage). On deep sandy soils as we have here west of Leamington, no drainage is required, as the water sinks into the soil quickly, and cultivation can be carried on in a short time after a heavy rain.

On heavier soil, it is desirable to have the water off as quickly as possible, in order to prevent the soil becoming hard and compact.

In a general way a half-acre will be found quite sufficient ground for most farm gardens. All the fruits that can be grown in the district in which the garden is situated, should be included, as the farmer is surely entitled to the best that his land can produce. There is no good reason why so many farmers should be without a good supply of fruits, both tree and vine, as is the case we find them in all parts of the country. The expense of procuring plants and trees is not large, if procured from a reliable producer of them. Too many are frightened out of buying them on account of the high prices asked by agents for some nurserymen. By purchasing direct, a far more reasonable price can be obtained. For a generous supply of fruit the following list will be found quite satisfactory. 12 blackberry; 25 Gregg black raspberry; 25 Cuthbert Red raspberry; 100 strawberries, either Williams or Nick Ohmer; 3 plants each Black Champion, Fay's and Cherry Currants; Columbus, Josselyn and Downing gooseberries; one each Moore's Early, Concord, Worden, Barry, Herbert and Brighton grapes; and if desired, trees might be added to the plot, in place of having them in the orchard with apples. Of peaches, where they can be grown, one each of Carman, Yellow St. John, Early and Late Crawford, Elberta, Bronson and Golden Drop; plums, one each, Lombard, Bradshaw, Imperial Gage, Reine Claude, Monarch and Satsuma; cherries, one each, Large Montmorency, English Morello, Windsor and Yellow Spanish or Napoleon Biggerau; pears, one each, Bartlett, Clapp's Favorite, Sheldon, Duchess, and Louise Bonne. If these trees are grown in the garden, they may have a hoe-crop grown among them, but in any event they must have good clean cultivation, as they will not grow satisfactory unless given the care that they should have.

In vegetable growing for the home, much pleasure and profit can be secured by a little extra effort. Early lettuce, radishes, and onions can be raised in a hot-bed, for using long before the out-door-grown article is ready. The expenditure of a few dollars for glass for the beds will be money well spent. If desired also, cabbage, tomatoes, pepper, egg plant, and cucumber plants can be started in the hot-bed for early setting. This work almost any farmer can do, and not have to rely on purchasing plants from

other growers. A small bed of asparagus is easily secured, either by purchasing plants or roots, or by growing them from seed. Horse Radish is procured from an old plot or roots procured from some seedsman. A good garden, should contain the following vegetables:—asparagus, peas, beans, beets, cabbage (early and late) carrots, parsnips, celery, cauliflower, lettuce, leeks, onions, parsley, peppers, squash, radish, turnips, tomatoes, horse radish, egg plant, some sage, savory or other herbs, and any other vegetable desired. To secure the finest tomatoes, they should be grown to a single stem, and tied to a stake driven in beside the plant, and when the plant is about five feet in height, should be stopped to allow of all growth going into the fruit. Melons may also be added where conditions are favorable.

In some gardens we find flowers interspersed through the vegetables, and this adds considerable to the appearance, but not every farmer can take the time for this part of the question. Where it can be carried out, however, the pleasure derived from such will recompense for the extra time employed. Dahlias, gladiolas, cannas as well as asters, marigolds and a host of other flowers, can be worked in in many places to advantage.

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## POTATO GROWING IN ONTARIO, AND A GENERAL REVIEW OF THE CONDITION OF THE INDUSTRY AT THE PRESENT TIME.

BY H. B. SMITH, B.S.A., WANSTEAD.

The potato is one of the most important food products of the civilized world. With a history dating back but little more than 300 years, it shows in that brief time a record of development unequalled by any other agricultural plant. Originally a native of the Mountainous tropic and subtropic regions of America, it was taken to Europe by the Spaniards early in the sixteenth century, and while it did not become popularized there so rapidly as here, it has during the last century become a staple and almost indispensable food with most European peoples. Nor is it important alone as a food necessity, for during the past fifty years vast developments have been made, especially in France and Germany, in the manufacture from the potato of starch for technical and commercial purposes and in the production of alcohol for light, power and fuel. Indeed in some European states the national policy is to encourage the manufacture of commercial alcohol from such sources as these in order that these countries may escape to some extent the importation of petroleum upon which a good many of them now depend for light and power purposes. It might be interesting in this connection to note that last year Germany devoted fifty per cent. of her potato crop to this purpose. That is to say seven hundred million bushels of potatoes, more than twice as many as were produced on the whole continent of North America, were used by these people in 1905 for the production of commercial starch and alcohol.

Potato growing takes rank right among the big agricultural industries of the present day. Pound for pound the civilized races, consume more potatoes each year, than they consume of any other agricultural product whatsoever. The world's potato crop in 1904, aggregated no less than 4,297,062,000 bushels, of which continental Europe and the British Isles produced 3,844,991,000, Asia 4,048,000, Australia and New Zealand 21,802,000, and North America 390,016,000 bushels. The Europeans are



the greatest producers and the largest consumers. Germany in 1904 produced more than four times as many potatoes as did the whole of North America. The world's potato crop averages every year a billion bushels more than her product of wheat. She produced last year just a little more than a billion bushels more potatoes than she did of corn, and just a little less than a billion bushels more than she produced of oats. Bushel for bushel the potato easily takes first place among the agricultural crops of the world.

**POTATO CULTURE IN EUROPE:** In Europe the potato crop is, relatively speaking, of greater importance for food and factory purposes than it is here. Its greater popularity there may in part be attributed to the success of maize as a starch producer here in America, and in some sense too, to the difference in economic and social conditions—land and labour values and food habits,—between the two continents. In Great Britain the potato is used almost exclusively as a human food, but in France and Germany, 40 or 50 per cent. of the crop goes annually to the production of alcohol and starch.

In continental Europe yellow fleshed varieties of potatoes only, are rated first class. These yellow varieties generally run a little richer in protein than the whites, but do not cook very dry at least not sufficiently dry to suit English, or American taste. As these yellow varieties are inferior for starch production purposes, the Europeans have developed a number of white fleshed varieties that run particularly high in starch content but which are almost worthless for table use. Hence it is that we seldom find any real valuable varieties among the potatoes that from time to time are brought into this country from Europe. The British market like our own, demands a white, dry fleshed potato. Hence it is from the British Isles that practically all imported varieties of any value come.

European methods of cultivation, management, etc., of the potato crop differ but little from our own. In general closer planting is practised there than here, and naturally more of the labour of cultivation, harvesting, sorting and so on is performed by hand. More attention seems to be given to the matter of seed selection than is given to that phase of the industry here, but their work is more along the line of importing stock for seed purposes, of changing a variety's climatic and soil condition, than of actually developing within the variety or strain itself, by a rigorous system of selection, those characteristics and qualities which are most desired and which should be perpetuated. For example, English growers find great merit for seed purposes in the stock imported from Northern Scotland and Jersey Island. The latter by the way produces the bulk of England's early supply, and prefers Scotch or English to domestic seed, while the Canary Islands, also large potato producers, bring in ship loads of seed from Germany annually.

Diseases similar to those which affect our own crop are well known in Europe, and the same remedies and methods of cultivation for combatting these diseases are in vogue.

**POTATO CULTURE IN UNITED STATES:** New York, Pennsylvania, Wisconsin and Michigan are the great potato producing states. Maine, however, in proportion to her area devotes more attention to potato growing than any other state in the Union. Aroostock county, in this state, is the largest potato producer, and because of the influence which this county has had upon potato production in New Brunswick, and because of the extent to which the potatoes of that province have established themselves in Ontario, and affected directly potato production here, we shall describe the conditions under which

potatoes are grown in this state. The description is taken in part from Bulletin No. 58 of the U.S. Department of Agriculture, Division of Chemistry, "The soil of this county (Aroostock) presents a generally rolling surface, and is essentially of drift deposited during the melting of the ice after the Ice Age, resting on a stratum of limestone which in some places comes to or near the surface. The soil partakes in a general nature of the drift, containing a considerable proportion of sand and the usual amount of organic matter. It is therefore a soil peculiarly suited to the growth of potatoes—a soil which does not pack after hard rains nor during periods of draught. Its open, porous nature permits the free development of the tubers and the evolution of rootlets, both lateral and perpendicular. This soil was originally covered with a dense growth of hard and soft woods consisting chiefly of maple, cedar, birch, white poplar, spruce, hemlock and pine. The forest growth was dense and in clearing, large quantities of ashes were produced which fitted the virgin fields particularly for potato production. After some years of cultivation the fields began to lose their virgin fertility and potatoes are now grown in these fields with a liberal application of farm manures, or commercial fertilizers rich in potash."

Another noted American potato state is Wisconsin. Here in a little triangular area, the sides of which are less than 30 miles in length there produced last year more than 60,000 acres of potatoes. Just as an illustration of the importance of the potato industry in Wisconsin, and to give an idea of the development potato growing has made there, it might be mentioned that in 1904 there were shipped from Plainsfield in this district 1,925 carloads of potatoes, and from Hancock, less than 8 miles away, 1,600 cars were loaded.

There is some difference between the Eastern and Western States in their methods of cultivating and handling the crop, but not sufficient to be marked. At present the general tendency in America is to economize in the use of hand labour, to employ set cutters, planters, horse cultivators, power sprayers, diggers, sorters, etc., Potato growing is becoming more and more of a special line of farming, particularly in the great producing states, and the indications are that this industry in the future is going to become more and more specialized than now.

#### POTATO GROWING IN ONTARIO.

The condition of the potato industry in this Province just at present is far from satisfactory. While Ontario stands first among the provinces of the Dominion in respect to acreage, total yield, and value of the potato crop, she did not produce sufficient last year to supply local consumption, and we were under the necessity of importing a good many hundreds of thousands of bushels of potatoes from the east. For a number of years there has been a steady and sustained decrease in the acreage annually planted to this crop in Ontario. Potato growing has ceased to be regarded as a money making business, and farmers generally are not only still further decreasing the acreage planted to this crop, but in a good many instances are ceasing to growing potatoes entirely. There are a good many reasons why conditions such as exist at present should obtain. Most of these reasons may be traced to natural or economic causes, and nearly all are amenable of entire or partial removal. It was to ascertain the cause of these present conditions that the writer first applied himself, hence it seems logical to discuss these causes here.



The causes that have likely induced the decrease in Ontario's potato crop during the past few years are:

- (1.) Scarcity and high price of labor.
- (2.) Blight during the past four or five years, most of which have been wet seasons.
- (3.) Low prices for the six years, 1896-1900, inclusive, followed by wet seasons and the blight.
- (4.) Comparatively low yields in older Ontario.
- (5.) Many farmers are still growing old, poor-yielding varieties, many of which are very subject to rot, such as Beauty of Hebron, 39 per cent. rot; Early Rose, 28 per cent rot; White Elephant, 30 per cent. rot.
- (6.) In some districts of the Province, on land that was originally well adapted to potato growing, potatoes have been produced so repeatedly on the same fields, in such close rotations, that the soil is depleted to a certain extent of some of its essential fertilizing ingredients, and will not now produce potatoes profitably.

We shall discuss these points in order and in detail.

I. Effect of labor scarcity on potato production. Farm labor in recent years has been steadily growing scarcer, higher priced, and less efficient. Ten years ago help was comparatively cheap, abundant and reliable. To-day we are paying an average of \$21.61 per month for the same class of labor which in 1895 cost an average of \$14.57, and at these figures a sufficient supply is unobtainable. Immigration, while it has tended to relieve to some extent the general labor scarcity, has not materially benefited the farmer. This scarcity of labor has affected every agricultural industry of Ontario, potato growing as much, if not more, than any other, since this crop is one that requires attention just at a season when other important work is pressing. Hence on farms where help is at a premium, and these kinds of farms are not by any means rare nowadays in Ontario, the tendency is to let the potato go and devote attention to lines in which so much help is not required. Just as an illustration of this general tendency, it might be mentioned that for no other obvious reason except the effect of labor scarcity on other crops, the area devoted to pasture lands in this province has increased in recent years by a million acres. Potato growing in Ontario is conducted to-day, at least so far as labor requirements are concerned, in precisely the same manner as it was practised here in the early days of last century. Farmers, in respect to this crop, have allowed themselves to remain altogether too dependent on manual labor. As well could we in these days produce the cereal grains after the methods of our grandfathers as grow potatoes in the ways now generally followed in Ontario. The potato industry in the future, if it is to be developed at all, can only develop through the adoption by our growers of labor-saving devices for handling their crops. To illustrate how labor-saving machinery will aid in bringing about this desired condition of affairs we shall quote one example. Down in the vicinity of Hamilton we know a grower who, without any help save at harvest time, produced last year no less than thirty acres of potatoes. He had solved the labor problem, as a good many other growers in Ontario will have to solve it in the near future if they are to continue being producers of potatoes. He used a complete outfit of planting, cultivating, spraying, and harvesting machinery, all of horse magnitude, and during the last year or two, with potato prices averaging away above normal and yields as a rule good, he has been making money in the potato business, and his entire outfit cost less than two hundred dollars.

II. The effect of blight under unfavorable weather conditions on the potato industry. For the past five years blight and rot have prevailed to an alarming extent all over Ontario. This widespread prevalence was due largely to the unfavorableness of weather conditions in every year from 1900 to 1905, inclusive, to the excessive precipitation during the season of growth, April to September.

The following table shows rainfall data for the growing seasons of the six years named:

Year.	Precipitation, April to September.
1900.....	15.4
1901.....	16.5
1902.....	19.4
1903.....	15.8
1904.....	19.9
1905.....	18.7
Average 1900-1905 .....	17.6 inches
Average 1882-1899 .....	14.9 inches
Average 1882-1905 .....	15.3 inches

The growing seasons from 1900-1905, inclusive, have been excessively wet, averaging 2.7 inches more rainfall than the average for the same season in seventeen years previous. These exceptionally wet seasons were unfavorable to potato growing in three ways: First, the wet spring retarded planting and decreased the acreage put to this crop; second, they were peculiarly favorable to the development of the blight; and, third, the excessive moisture in the soil would have a tendency to produce rot, quite apart from that caused by the blight. This would be particularly the case on clay or clay loams.

The weather is one factor in production quite beyond the producer's control, but some of the conditions which it induces are quite controllable, as, for example, the blight. Blight during recent years has wrought much havoc in potato growing. In New York State last year it is estimated that the loss of more than 50 per cent. of the potato crop, which occurred then, was due to it alone. Here its ravages have been no less severe, neither do we think the percentage loss last year to Ontario potato crop was less than 50 per cent., generally speaking, but very little effort is made by farmers in this Province to offset its ravages. Altogether too many of the so-called intelligent people are prone to believe that it is useless to contend against such things; that blight and such "plagues" are but a visitation upon them of the wrath of the Almighty. Too many, despite the abundance of literature circulated gratuitously among them, are entirely ignorant of the nature of the disease which for the past few years has been destroying their potato crops, and few or, practically speaking, none at all, among the general farmers are doing anything, or have any idea that there are remedies which, if properly applied, will lessen or completely check its ravages. Acting upon the principle that it's an ill wind that blows nobody good, enterprising manufacturers have risen to the opportunity, and at various times have placed "blight cures" upon the market. Usually through the influence of the local salesman or agents, farmers have given these preventives a trial. Most of them, of course, were absolutely worthless, though a few, of which Bug Death is a good example, seem possessed of some value in controlling the disease. But usually the cost of these manufactured fungicides is excessive. Bug Death, for example, sells for \$7 per hundredweight. One hundred



pounds per acre is the usual treatment, and where more than one application is required the cost comes rather high. But the great remedy for blight—Bordeaux Mixture—is practically unknown; outside the fruit districts its value as a controller of plant diseases has never been appreciated. Just so long as potato growers take no cognizance of and fail to apply the remedies that science devises and the best experience shows to be of value in controlling the diseases which affect this crop; just so long as the majority of our growers attribute blight, rot, scab, etc., to such causes as they are, on the back concessions of Ontario, usually attributed to, as, for example, lightning, the bugs, the use of paris green, changed climatic conditions, etc., etc.; just so long as such disinterestedness and lack of information as this prevails, just so long shall we find that in seasons of unfavorable weather conditions, or, in fact, in any season at all, blight, rot, and other diseases will continue to ravage our potato fields.

Of course, the failure to apply the proper remedies is not entirely due to the fact that farmers are unaware that such remedies exist. Such failure is in some measure associated with the scarcity of help. Undoubtedly were labor as abundant as formerly, farmers, as a class, would endeavor to treat their potato crop more carefully than they now do. But growers might as well cease believing that labor will ever again be as plentiful and cheap as it was ten or fifteen years ago. They might just as well begin now to console themselves to the fact that it is in labor-saving machinery, not in the laborer himself, that in future their capital must be largely invested. We believe, too, that as time goes on the potato in Ontario will cease more and more to be a general crop. In these days it is no business for the mixed farmer. It is the specialist in these times who is making money at potato production. It is the mixed farmer, the general farmer, the man who grows less than an acre of potatoes, perhaps only a few rows, who generally suffers most from blight and other diseases, who derives the smallest returns from his crop and who generally has the loudest complaint to make about scarcity of help. The conditions indicate that potato growing will, and should, become more and more a special line of farming.

III. Low prices, 1895-1900, inclusive, and the effect which such prices have had on potato production since. Low market prices, which means, of course, low net returns per acre, from 1896 to 1900, followed from 1901-1905 by wet seasons, general failure of the potato crop by blight, rot, etc., had a very natural tendency to drive growers from the business. We reached high-water mark in potato production in 1895, when our total product aggregated 29,390,884 bushels. Now, Ontario, by approximate estimate, consumes annually between fourteen and fifteen million bushels of potatoes. In 1895 the potato crop all over North America was unusually heavy. The United States produced in that year more potatoes than she ever produced in any single year before. She produced fifty million bushels more potatoes that year than she has ever been able to produce in any year since. With nearly twice what we required for our own consumption produced at home, with the American market, where formerly our surplus stock was disposed of, glutted likewise by overproduction in that country, it is only natural that potato values should suddenly shrink. It is only natural, too, that low prices prevailing for two or three years in succession should drive men from the potato business. Supply and demand fix the price in potatoes, as they fix it in everything else, except, of course, those commodities the sales of which are controlled by trusts, or the production of which is affected by the exorbitant cost of labor; hence when the visible supply of stock showed a sudden and unusual increase, and the demand stood practically the same, potato

prices were bound to fall and to keep right on falling all the time until equilibrium between these two great controlling forces was again fairly established. The following tables show the market and acre value of the potato crop in Ontario, 1895-1900 and 1901-1905, inclusive:

Year.	Price per bushel.	Value per acre.
1895.....	20.2 cents	\$32 15
1896.....	26.2 "	31 19
1897.....	39.9 "	37 94
1898.....	44.1 "	37 26
1899.....	32.8 "	38 88
1900.....	26.1 "	34 32
Average 1895-1900 .....	31.5 "	35 29
Average 1882-1895 .....	41.3 "	49 21

It will be noticed that every year between 1895 and 1900 was below the average value per acre for the period 1882-1895, and in every one, save 1898, the price per bushel likewise was below the average for the preceding thirteen years.

For comparative purposes it might be interesting to notice the value per acre and price per bushel of the potato crop since 1901. The figures used may not seem to bear out all that we have been saying about supply and demand being the controlling factors in production, and that enhanced values and greater returns per acre from any crop naturally induced increase in its production. Since 1901, in the face of the facts which show remarkable increases in acre values and bushel prices, there has been a most remarkable, and from an economic standpoint most inexplicable decrease in the acreage planted to the crop. Between 1901 and 1905, blight first appeared seriously in Ontario potatoes, and though prices and values have ruled higher than the average the uncertainty year by year of harvesting a crop, detracted from the enterprise. In the table below are the average values per acre and per bushel since 1901:

Year.	Price per bushel.	Value per acre.
1901.....	42.6 cents	\$50 06
1902.....	56.5 "	50 52
1903.....	44.9 "	52 92
1904.....	50.7 "	58 81
1905.....	46.0 "	49 68
Average 1901-1905 .....	48. "	52 39
Average 1895-1900 .....	31.5 "	35 29
Average 1882-1900 .....	39.2 "	45 50

IV. The effect of low yields on the potato industry. All over Ontario for the past five or six years the yield per acre of potatoes has been comparatively low—too low, in fact, to warrant even a continuation in the industry, let alone any increase in planting.

V. Many farmers are growing poor, low yielding varieties, most of which are subject to rot. From an examination of the returns of some 200 experimenters in different parts of the province in 1906, the following varieties, in order, were most favorably spoken of. Since then, from what we could learn on this point in our investigations, we are convinced that the figures are sufficiently correct for comparative purposes:



Name of variety.	Percentage grown.	Percentage rot.
Empire State .....	20.0	23
White Elephant .....	11.3	30
American Wonder .....	8.8	24
Beauty of Hebron .....	7.5	39
Rural New Yorker .....	6.9	26
Pearl of Savoy .....	5.6	27
Early Rose .....	3.7	28

That is to say, 64 per cent. of the farmers of Ontario are growing varieties of potatoes that average very high in percentage of and susceptibility to rot. We are not going to add anything more on this point. Full information as to what are the best yielding and most immune to rot varieties of potatoes is available to every grower in Ontario. The results of hundreds of potato experiments conducted at Guelph and Ottawa have been published and freely distributed from time to time. We refer the reader to them for such detailed information.

VI. Have some Ontario potato soils become depleted of some of their essential fertilizing ingredients? We have discussed causes of acreage decrease under five heads, and covered all possible grounds pretty fully. Part of the decrease is, of course, attributable to the blight, to the unfavorable weather conditions, and to insufficient cultivation and attention due to labor scarcity, but over and above all this there seems to be, particularly in the older growing potato districts, as around Hillsburg, Erin, and Orangeville, a general idea among growers that the soil will not produce as large yields as formerly; that they have grown potatoes too long. The fact that the potato land in these districts is a fairly light, sandy loam, that potatoes year after year have been grown on this same soil, with no return in the form of fertilizer excepting barnyard manure or an occasional crop of clover plowed under—both of which are nitrogenous fertilizers—would seem to indicate that there might be some deficiency in the mineral constituents, most probably potash. It has been the experience in all countries where potato growing is largely followed, in Maine and more lately in New Brunswick, that potatoes grown on the same soil in short rotations with cereals and legumes, tend to deplete a soil of its potash and, to a less extent, of its phosphoric constituents, and unless these elements be added in one form or another potato growing in the course of some years must be abandoned. In Aroostock County, Maine, as we pointed out, potato growing is not now attempted without the use of what are locally known as potato manures, fertilizers rich in potash compounds. More lately still, in New Brunswick, the same necessity has arisen, and more commercial fertilizers are now used in that province annually in potato growing than are sold for all purposes in a year in Ontario. The best of our potato soils resemble those of the east very closely in physical character and constituents. Originally they contained a sufficiency of potash for all ordinary production purposes, and this supply was still further augmented by that derived from the clearing off of the forests, but potatoes are especially exhaustive of this plant food, they make no return whatever to the land, and this production for so many years has tended to impoverish those fields to such an extent that they do not now yield sufficiently to make potato growing profitable.

#### PRESENT CONDITION OF POTATO GROWING IN ONTARIO.

A general review of what is being done in potato growing in this Province just at present will now be attempted. This review will be taken up

district by district, and will cover the most important potato producing sections visited. Eastern Ontario districts, it will be noticed, are not very fully taken up, not because potato growing there is any less an important industry than it is in the west, but simply because from what we did observe, potato conditions in Eastern Ontario are identical with those in the west; hence a description of one's condition would be in a fair measure a description of the others. Therefore, for the sake of expediency, we gave most attention to the west. The methods of cultivation and management of the potato crop of one or two of our best growers will be given in detail. The remainder of the information was derived from the potato shippers in each district, from the growers themselves, and from our own observation.

**STRATHROY DISTRICT.** Carodoc Township, and to a less extent the Townships of Delaware and London, in West Middlesex, form one of the most important potato districts of the western peninsula. The soil of Carodoc is almost ideal for potato growing, being a medium sandy loam, well supplied with organic matter, early, easily worked, easily drained, suffers little from drought, and does not "bake." In Delaware the soil runs swampy and fewer potatoes are produced. In London the soil is slightly heavier, and this crop is less extensively cultivated.

The Dooley is the favorite late variety. It is believed by some to be a variety originated by selection from either the Carmen or Rural New Yorker. It is a late potato, spoken of as fairly immune to rot, looks good, sells well, but lacks a trifle in table qualities, being wet and off color until late in the season. Empire State, North King, and Dewey, together with a good many others, are also grown. The first two named are favorably spoken of for productive and market purposes, but Empire State is generally believed to be rather too subject to rot. The Irish Cobbler is largely used as an early variety.

**METHODS OF PLANTING AND CULTIVATION.** Clover sod seems the favorite potato soil, but opinions differ very widely as to what preparatory treatment gives best results. Methods of preparation differ with the man and the system of planting which he practices. As a rule, the more thorough this part of potato growing is attended to the better the results that are obtained. We shall indicate a couple of planting systems just to illustrate this phase of potato growing.

1. *Shovel Method of Planting.* The land is given thorough preparation and marked off in three-foot squares. A shovel is used for opening the hills. The digger opens his first row of hills and simply throws the earth to one side. The planter places one or two sets in each hole. When the second row is being dug, the man with the shovel covers this first row of seed with the earth from the second row of hills. The planter follows him closely, and when the last row of holes is opened only one row of seed remains uncovered. This is a fairly rapid hand system of planting; the rows "run" both ways, which greatly facilitates future cultivation.

2. *Plowing the Potatoes In.* In planting in this way sod or stubble land is simply plowed and the tubers dropped in every third or fourth furrow. This method, while much quicker than No. 1, gives the land no preparatory treatment. The rows run in one direction only, and if weeds are bad, hand hoeing must be resorted to. With this system some apply their manure in the winter; and in May, when the clover, or, if it is a stubble field, the weeds, have been stimulated to some growth, the field is plowed down and the seed placed in every third furrow. For both these planting methods clover sod is the favorite soil, and after that wheat stubble would be first choice.



**CULTIVATION.** Cultivation, most growers admit, is insufficient, chiefly because of the difficulty in getting help when the cultivation requires attending to. The general tendency here seems to be to "hill up" slightly, in preference to level culture; but, so far as we could learn, as good results are being attained with one system as the other.

**POTATO DISEASES.** Blight (*Phytophora infestans*). The common, late blight of the potato has prevailed here to no small extent in recent years, but very little seems to have been done to combat or prevent it. Only one grower—Mr. Creely—owned a power spraying outfit, and treated his crop with Bordeaux Mixture. He was meeting with satisfactory results. Most of the other growers' professed being too busily engaged haying and harvesting during blighting time, and preferred letting their potatoes take chances with luck and Providence. This is the great trouble in all mixed farming sections. Farmers "sidetrack" potatoes every time anything else requires the doing. They are quite aware of the fact that potatoes in the last few years, where they have been a good crop, have paid handsome profits, but at the same time they continue year by year to neglect the potato crop when haying season comes around: and while all profess utter inability to find help to attend to their potato crop, which they know, if successfully brought to maturity, will yield them anywhere from sixty to one hundred dollars per acre, they never fail and by some means or another get sufficient help from somewhere to harvest their timothy hay, which in some exceptional years may yield them fifteen dollars per acre. We are convinced, after extensive observation and enquiry, that while the scarcity of labor is a probable cause of decrease in potato growing, it is not yet sufficiently acute to be accepted as a reason for neglecting the potato crop entirely.

It is the mixed farmer who invariably feels this labor scarcity most, and mixed farming and potato growing never go successfully together. Whoever it was that originated that old saying that the great advantage in mixed farming was that you did not require to have all your eggs in the one basket and got his idea made the basis of agriculture all over this continent, may have been wise enough in his own generation, but were he alive to-day and could travel over some of the back concessions of this province, he might find, in so far at least as potato growing was concerned, that the men who are living up to his ideas and practising the principles which he and the likes of him promulgated, have, as a rule, more empty baskets sitting around their premises than those who centre their energies on one or two things, and have fewer baskets to attend to and more stuff to put into the ones they do attempt to fill. In Ontario at the present time the man who is making any success at potato growing is he who is making the business more or less a specialty.

**HARVESTING, YIELD, STORING THE CROP.** Harvesting here in Carodoc is mostly performed by hand labor. The potatoes are either turned out with a plow or dug with a potato fork. Creely, if we remember rightly, has a digger. The average yield in 1906 would be about seventy-five bags per acre. Farmers, as a rule, like to sell direct from the field at digging time, but the bulk of the crop is stored and sold during the winter. Pits in the field, bins arranged in the basement of barns, and the cellars under dwelling houses are used for storage purposes.

**MARKETING.** Last year about 75,000 bushels were shipped from here. A good part of Carodoc's crop goes, of course, to supply the London market; the remainder is shipped west into Essex, Kent, and Lambton, to such towns as Chatham, Windsor, Tilbury, Petrolea, Sarnia, and Wallaceburg. In the fall, when shipments are made direct from the field as the crop is being

harvested, no attempt is made to grade the tubers to size, nor is anything like this expected by the shipper. Potatoes are taken just as they are picked up. When a shipper desires to load a car he goes out to the farmers of the district and makes arrangements to have the goods delivered. Fifteen or twenty farmers will be loading into the same car at once. Each of these men, it may happen, will have a different variety of potatoes. Two or three will be hauling in the Dooley's, some others Empire State, some more will have an early variety, probably the Irish Cobbler, or such late varieties as Hebron and Elephant, while quite a number of others are just loading in "potatoes." They are not certain whether or not they are of any particular variety. All sizes, shapes, color, and quality of potatoes are in evidence, mixed together in the most inseparable manner, and when they reach the consumer they are mixed quite as inseparably in the peck or half bushel which he purchases at the corner grocery, a sample of every variety of potatoes grown in the district from which this particular car lot comes will be served up before him on his table. To market our stock properly is one of the most important things which our shippers and growers require to learn, and we are afraid that it will require a whole lot of educational work, as well as co-operation between the grower and shipper before Ontario potatoes will be placed on the market in the condition and form in which they should be marketed.

ST. THOMAS, UNION, OR PORT STANLEY DISTRICT. Commencing at Union, or White's, on the P.M.R.R., about six miles north of Port Stanley, a strip of sandy loam begins, and continues eastward through Yarmouth and Bayham Townships to Houghton. All through this section the soil is almost ideal for potatoes, and some quite large acreages are grown east of Union. Many of the hundred-acre farms produce from eight to twelve acres every year. Varieties are mostly Hebrons, Empire State, White Elephant, and Carman. Cultural methods generally resemble those of the Carodoc district very closely. Part of the crop is marketed locally—that is, in St. Thomas, though quite a few car lots are shipped east and west. Spraying for blight is not followed, though the disease prevails to quite an extent. Paris green, dry or in solution, is the general insecticide. Yields average about 100 bags per acre.

ELGIN AND NORFOLK COUNTIES. In the southern portion of Malahide Township, in Elgin, and in the townships that adjoin it on the east and, continuing onward toward Simcoe, there is a strip of sandy soil, well adapted for potato growing, but on which the crop for various reasons is not generally grown. One of these reasons, we were told, was that shipping facilities were not good, that from these fields the distance to railroads was too great. Others professed being unable to raise the crop successfully because of blight, and others couldn't get sufficient help to handle a large potato acreage. Eighteenth century methods largely prevail. One of the apparently most successful growers through all this district was Mr. Oscar McKenney, of Aylmer. Mr. McKenney, we were repeatedly told, was the most prominent grower, and when we interviewed him we found that he had so many new and (tons at least) original ideas on the potato growing business that we have selected his as one of the two systems of management which we are going to outline in detail.

Mr. McKenney engages quite largely in potato growing, and plants annually about eight acres. His crop is managed by an 82-year-old man—an Irishman, by the way—who claims to have done nothing all his life but grow potatoes. The results indicate that he has learned potato growing pretty thoroughly. Mr. McKenney's methods are about as follows:



As early in the spring as is practicable—this year he expects about April 12th; (Mr. McKenney planted his potatoes on April 11 and 12, 1907)—he plants his potatoes. He prefers and always uses a sandy loam soil. The preparation is to plow down a well manured clover sod in the fall, cultivate this soil thoroughly and early in the spring, and put in the seed at the earliest possible date. In the way of fertilizers, he uses nothing but horse manure. Ordinary farmyard manure he would use in no circumstances whatever. He attributes the prevalence of scab in potatoes largely to the use of cow manure. The field is marked off both ways, the rows being three feet eight inches apart and the hills three feet apart in the rows. A plow is used for planting, the rows being opened four or five inches deep, and the seed dropped at the point where the cross rows intersect the furrow. The seed is covered up level, and is on an average about four inches deep. Nothing but the largest, strongest looking tubers are used for seed. In cutting the sets the seed end of the tuber is discarded, as it is likely to produce too many stalks and too many small tubers. The sets are cut good and large, with one or two eyes each. He likes to have the pieces good and large, so as to supply plenty of nutrients until the plant gets to the surface of the soil. Not more than two sets are put in a hill. Too much seed, he believes, causes too many small potatoes. Cultivation is done by scuffer and hoe, as frequently as the crop or season requires.

It is in the matter of insecticides that Mr. McKenney's ideas and practices differ most widely from the average grower. He uses no paris green or "bug poison" of any kind. His practice is to engage youngsters to pick off the "shell backs" just as soon as they appear in the spring. Living near town as he does, he can get this kind of help quite easily, and by paying a certain fixed price per hundred beetles captured he can get good work done all the time. The picking is done into pickle bottles, each supposed to hold a certain number of "shell backs" when full. Having got after the promoters of the bug business in this way, few eggs are laid and few larva appear. Neither does Mr. McKenney use Bordeaux or anything else for the blight. His ideas on this disease sounded strange to us, and were he a less successful grower we would regard them as pure nonsense. The fact, however, that he is now growing potatoes and has grown them all these late years, while his neighbors on the same land and just across the fence, lose from one-third to one-half their crops annually, makes his ideas of some importance and his methods of some significance. Blight and its accompanying condition, rot, he attributes to the use of paris green. The green gathers at the junction of the leaf petiole and main stalk, poisons the plant, as it were, and leaves it easily affected by disease. We are rather doubtful if this is anything more than theory; in fact, we feel certain that paris green, if properly applied, can neither cause blight nor yet injure the plant to such an extent that it is more susceptible to the disease. We are inclined to think that the real reason for Mr. McKenney's success is that he plants extremely early, uses strong seed, and gets a strong, vigorous plant, well grown before the season for blight really occurs.

In the matter of varieties Mr. McKenney grows quite a number, since he exhibits his goods largely at local fairs. Among the best of these are Great Divide, Early Sunrise, Carman No. 3, Boston Market, Bovee, Russet, and Rose of Erin. Of these for a general crop potato, for sandy loam soils, Carman is preferred. It grows large, yields well, is smooth, fairly shallow-eyed, and free from scab, warts, and protuberances. Potatoes are stored in pits in the field and in cellars.

In Elgin County, Yarmouth is the only township of any importance as a potato producer. The northern part of the county is not at all adapted for potato growing.

**NORFOLK COUNTY.** In Norfolk County, at least in the southern part, the soil is fairly well adapted to potatoes. The potato here cannot, however, be regarded as a very important crop. The prevalence of blight in recent years, together with the great development of the fruit industry, has caused farmers to pay less attention than formerly to potatoes, with the result that whereas ten or fifteen years ago a good acreage was grown and shipped, the average now would not be one acre per hundred. Apple growing is more profitable industry and, on the average, surer. But the only reason it is any surer is that farmers here have learned the necessity of spraying to combat the diseases and insects that affect fruit, while they give no such attention to the potatoes. Potato spraying is not practised to any extent, though farmers are quite aware of the value of Bordeaux in controlling the blight. Some years ago an object lesson on the value of spraying was given on the fair grounds by the Simcoe Agricultural Society, and seems to have had some results—at least, it showed clearly that there was a remedy for blight. All varieties are grown here, and most farmers with an acre or two are growing five or six different varieties, generally so badly mixed that they don't know what they have. White Elephant is as common as any, together with Beauty of Hebrons and Carman No. 3.

**BRANT COUNTY.** Brantford Township—at least, that portion of it lying to the westward of Grand River—is the principal potato producing section in Brant. The soil is a sandy loam, well suited to potato culture. Mount Pleasant (Mohawk P.O.) is the centre of the district and the main shipping point. From this station last year about twenty cars were shipped, principally to Western Ontario, Chatham, Windsor, etc., at an average price per bag to the farmer of 65 cents. Carmen No. 3 is the main cropper, though here, as elsewhere, every variety is grown. Shippers here, in common with all the rest of their class in Ontario, complain much of the difficulty in getting farmers to grade their stock properly. There seems to be among all farmers an inherent tendency to try and load anything that looks like a potato in the cars. The very natural result is that Ontario stock always sells for an average of 10 or 15 cents per bag less than the better graded stuff from New Brunswick.

Rot has prevailed around here to some extent, though apparently not quite so bad as in some other places. No spraying is done except for bugs. Bug Death is sometimes used as an insecticide and fungicide with good results, but its cost is too great for it ever to come into general use. Yields in this neighborhood run about 100 bags per acre. J. C. Biggar is the best grower here.

**OWEN SOUND AND WILKINSON.** In Northern Grey, Derby is the principal potato producing township. Around Owen Sound—that is, within four or five miles of town, west or south—the soil is sandy loam on a limestone bottom, naturally well drained, and good potato land. Farmers, though, are not very heavily engaged in the potato business. One, Mr. W. L. McHardy, has grown as high as twenty acres, but the average is not more than one. The acreage is increasing here, however, as just now farmers are finding out that profits from potatoes cannot be equalled by any other crop. The yield varies with the grower, but will average about 100 bags per acre. Some talk about getting 150 bags per acre, but farmers, as a rule, have little idea what their crops are yielding. Their estimates are usually little better than guesses.



Owen Sound offers a fair market, particularly during the fall, when the supplies are being shipped out to the lumbering camps along the north shore. The potato crop on Manitoulin Island affects this market to some extent, and in case of a good crop there values in Owen Sound are likely to be low.

Most growers are using old varieties, such as American Wonder, White Elephant, Early Puritan and Early Canada. The early crop is of considerable value here, as the C.P.R. steamers and other boats going up the lakes, get their supplies here during the navigation season. Rot prevails to some extent but the best growers control the disease pretty effectually with Bordeaux. One of the largest growers in Derby, uses no fungicide, believing it injurious to the crop. Too many farmers, it seems to us, develop erroneous ideas in respect to Bordeaux and Paris Green. The grower in question, used it only one season and made four applications. The trouble with him was that the fungicide kept the tops green too late in the season, the crop did not mature properly, the potatoes went off quality before spring, and he suffered some loss in consequence.

Around Wiarton the soil on the average is a fairly good potato soil but potatoes are not a very important branch of agriculture. The average acreage devoted to the crop per hundred acres would be about  $\frac{3}{4}$  of an acre. All varieties, and nearly all possible combinations of varieties, are used. For early cropping the Early Ohio is favored, and as quite a business is done here, in early potatoes, with the numerous summer resorts along the lake shore, some farmers plant quite largely to early varieties. For main crop Empire State is the common variety with Beauty of Hebron, Late Rose, White Elephant, American Wonder, etc., etc.

Planting here is generally delayed until rather late in the season. Farmers generally, planting late to avoid the bugs. Spraying is not practiced to any extent. Mr. Cecil Swale the largest grower in the district is the only man we know of who uses Bordeaux. His experience in its use was highly satisfactory. He sprays about three times per season, uses an ordinary "squirt gun" sprayer, mixes his solution after the well known 4-4-40 formula, and has always had profitable results. His average yield year in and year out is 200 bushels per acre. From what we could learn of the district generally, unsprayed crops were yielding about 100 bushels per acre. Mr. Swale estimates the cost for spraying, materials and labour of applying, at about five dollars per acre per season.

*Orangeville District including Erin, Hillsburg and Garafraxa.* Orangeville, and all other potato districts around here, are situated in the belt of high land that stretches right across Ontario from Niagara to Georgian Bay. All this area is more or less adapted to potato growing, but around Orangeville the business has been most largely developed. The district is supposed to be the best for potato growing purposes of any in the province. In former years it was from here that Toronto drew the bulk of her supply, and thousands of bushels also found a market on the other side of the line. But in recent years all this has changed. Toronto dealers have ceased buying here almost entirely and the Americans no longer look for any of their supply in this direction. The principal market for Orangeville potatoes nowadays is Western Ontario, London, Chatham, Leamington, Windsor, Sarnia and Petrolia. About 60 cars were shipped from this point last year at an average price to the farmer of about 70 cents per bag. A good yield is one hundred bags per acre. This yield however has seldom of late years been obtained.

Rot prevails to a very dangerous extent but farmers spray for nothing save the beetle. They are backward too, in the matter of appliances for handling their potato crop. Diggers are unknown, planters are not used at all, and spraying outfits generally very primitive in their character. Few farmers are now growing more than an acre or two. Five acres is considered a very large acreage. Mono township is the main potato producer up here.

*Hillsburg.* Hillsburg used to rank as the centre of one of the very best potato districts in Ontario. From this point, until within the past few years, from 150 to 200 cars of potatoes would be shipped yearly. Now about 20 is the usual output. Farmers who formerly grew from 10 to 20 acres now average less than two, and the acreage planted is still annually decreasing. The causes of this decrease are the same as are general over the province, viz., the blight, and the scarcity of labour. Farmers around here are altogether too dependent on manual labour in potato growing. They are not using any labour saving machinery such as planters, sprayers, harvesters, etc. Hence it is that the labour scarcity affects these people so greatly. In the matter of spraying for blight, nothing has been done. Lack of help is advanced again as the common excuse for this. But generally speaking, farmers who advance such excuses as this for not spraying, who are appalled at the labour required to spray with Bordeaux three or four times during the season, belong to that class of growers whose experience in "spraying" is confined to the watering can system, and who always estimate the labour required to spray by the amount that is required to sprinkle a field with a two gallon sprinkling can. Men who use proper spraying outfits, such as will cover 15 or 20 acres a day, seldom have much to say concerning the scarcity of help.

Farmers here seem "tired" of potato growing. Hillsburg has for years been a heavy potato producer and the soil seems to be less productive than formerly. Farmers are beginning to be careless, some spray for the bugs and some let the bugs have the crop. Many claim that the potatoes are too hard on land, that they make no return to the soil. To this argument of course there is much reason. Yields have undoubtedly decreased in recent years. The soil here is sandy loam, naturally it would contain but a relatively low percentage of potash and phosphorus. Potatoes require quite large amounts of these constituents in their growth. Hence a soil fertilized only with stable manure or clover, might by this means become deficient in the mineral constituents of plant growth. This objection is general in this locality.

In the matter of varieties nothing but old, poor yielding kinds are grown, White Elephant, Burpee's, Woodhull, Pearl of Savoy and Hebron are the leaders. A variety named Carters is grown to some small extent in the belief that it is "rot proof." It's a failure. Planting is done about May 24th. Planting and handling the crop is a laborious business, farmers have no machinery at all, and despite the fact that the farmers of this district have been accustomed to grow thousands of bushels of potatoes each year, few of them have any easy way of storing and handling their product. The crop is largely stored in cellars beneath the dwelling houses. The bags as they are brought in from the field are emptied into these places and when required the stock is rebagged by hand and carried out again.

Farmers here learned potato growing in the days when labour was abundant and cheap, as a class they seem well satisfied with the methods followed. They seem slow to adopt new ideas, and in fact very few but their own ideas ever seem to have been promulgated among them. Hence it is while methods of potato growing have changed greatly within recent



years, methods employed here are the same as were in vogue in the old days, the days when Hillsburg potatoes were the best that found their way into the Toronto markets, when "the buyers from the United States came down through Erin and Garafraxa to get supplies for Buffalo and New York." That men could be engaged in potato growing, as something of a special line of farming for years, yes for whole decades of years, and still know so little of the diseases and the treatment for these diseases that affect this special crop, is a matter of surprise. This is the first district, in fact the only district we have visited, or known in Ontario, where farmers had not heard something of such well known fungicides as Bordeaux mixture, and where some at least had not used the same. The Hillsburg, Erin and Orangeville districts are perhaps in potato growing the most backward districts in Ontario.

We have covered quite fully the general conditions of the industry in the province. There is a terrible sameness in these conditions and sufficient has already been said regarding them. Before proceeding to the next phase of our subject we shall give in detail an account of the methods by which one of the very best potato growers in Ontario is averaging each year more than one hundred dollars per acre from this crop. This grower's methods differ widely from those of the other we described, and we insert them here because they are of the kind that will have to come into more general use if potato growing is to be followed as a profitable industry in Ontario. This grower is Mr. Noah Diamond of Jerseyville, Ont.

Mr. Diamond makes a specialty of potato growing and plants from 30 to 50 acres per year. His land is a trifle heavy to be called an ideal potato soil, but by using farm yard manure and plowing down clover he keeps it in condition for producing large yields of this crop. The variety used until this year was Empire State entirely. He begins planting about the end of April and tries to get all in as early as possible. He selects the largest tubers for seed, cuts to sets of two eyes each, plants in rows with a planter; in fact does all work in connection with the crop by machinery. Last year he treated his crop seven times with Bordeaux mixture and used in the treatment 1,400 lbs. of bluestone. The whole work of caring for the potato crop is done by one man, except at harvest and seeding time. Average yield one year with another 230 bushels per acre, and average returns per acre from one hundred to one hundred and fifty dollars. Mr. Diamond considers that no crop which he could grow would yield anything like such returns as this, in fact believes that at half the present prices it would be the best paying line in which he could engage. He markets quite a quantity of his crop by waggon and carload in Hamilton, sometimes ships some west to London and other western centres.

Despite Mr. Diamond's success in this line other farmers in Jerseyville district do not engage very extensively in the business. The old excuse is as usual, advanced that potato growing makes too much work, in these days of labor scarcity. Machinery has made it possible for the specialist to continue in the business and even to increase his acreage largely without increasing the help required, but to the ordinary farmer a full equipment of implements comes rather expensive. In fact the cost under this head to the man growing an acre or two is practically the same as to the man who grows forty or fifty.

Some of the good potato districts in Ontario not yet mentioned are here given. Hepworth, up in the Bruce Peninsula, the centre of a very productive little section. Soil is well adapted for the growth of the potato and farmers seem to be increasing the acreage devoted to the crop. The con-

dition of the industry there, generally speaking, is the same as elsewhere.

Dublin, north of Stratford ships a few potatoes and some few are grown in the section around it.

In most of the townships around Hamilton and north west through to Brantford, potatoes seem to be quite largely grown.

Another little district where the cultivation of this crop is about as well advanced as any place we know is at Acacia, south of Tilsonburg. Soil is idle and farmers seem to be taking an intelligent interest in the industry.

Then in the north, that is north of Orangeville, and right through to Georgian Bay, around Shelburne, Angus, Alliston, Mono Mills, and up around Allandale, Barrie and Penetang, potatoes seem quite largely grown. The little district about Angus is the best in all Ontario. The industry is in better condition there and better stuff is being shipped out of Angus just now than is being turned out of any other shipping point in Ontario.

#### QUANTITY AND QUALITY REQUIRED AND THE SOURCE OF THE POTATO SUPPLY OF SOME OF OUR LARGEST MARKETS.

##### *Toronto.*

*Quantity required:* From 2,000 to 3,000 bags per day, which amounts to at least 30 cars per week, for every week of the year.

*Quality required:* A large, white, thin skinned, shallow eyed kind, free from dirt, rot, scab and sunburn, must be dry cookers and car lots should always be graded to size and if possible of one variety only. Red potatoes are sold only during the new potato season in June and July, when Early Ohios fill the demand. The New Brunswick Delewares are favorites at other seasons.

*SOURCE OF SUPPLY:* From about the middle of September of each year until the new potato season begins in May or June, the greatest portion of the city's supply comes from New Brunswick, from a certain district near the Maine border, and of which Woodstock, roughly, is the center. During this season, for the past three or four years little but Eastern potatoes are received. Relatively speaking only a few car lots of Ontarios are used, and these that are marketed here come mostly from Alliston, Uxbridge, Erin, Hillsburg, Angus, Bellwood and Orangeville. Some potatoes from such local points as Clarkson's, Port Credit, Lorne Park, Dixie, etc., are marketed during the winter in waggon loads, but at least 80 per cent. of the potatoes consumed in Toronto during the months from September to June, or from 800 to 850 carloads, come from New Brunswick. Some seasons quite large importations of Quebec stock may be made by local wholesalers, but very little of these are consumed in the city, the great proportion being unloaded on to dealers in the smaller towns who buy in car lots from these Toronto people. Sometimes too, Nova Scotia and Prince Edward Island potatoes are quoted during the winter, but very few are sold in Toronto, at least not in recent years. "Old" potatoes remain in the market usually until July or August, a certain demand existing for them among hotels and restaurants.

In May the American new potatoes come in, the first to reach Toronto are usually from Texas, of a variety known as the Bliss. They are sold by the barrel. In July, or sometimes earlier, local gardeners commence bringing in their stock. These potatoes have been "sprouted" in green houses or cold frames and given a good start before planting, they are gotten into



the soil as early as possible, as the first stuff to reach the market is worth from three to four times the average for the season.

Below is a summary of remarks made on the potato business of Ontario and Toronto by two well known potato dealers of the city.

Mr. J. J. Ryan handled last year from October 1st to April 1st, an average of one car of Maritime potatoes per day. Had "turned over" last year in all from 180 to 200 carloads from New Brunswick, and less than one car of Ontarios. New Brunswick stock was always larger, cleaner, and contained less scab and rot than Ontario grown potatoes, and readily sold for from 10 to 30 cents per bag more than our stuff. Just at that time (March 12) Ontarios were selling in car lots at 85 cents per bag and New Brunswicks at \$1.15.

Our potatoes nowadays are poor sellers, and the consuming public do not want them. The quality of the potatoes has remained about the same; but as Mr. Ryan remarked. "The people of Toronto can afford to eat good potatoes, they've got the price to pay for them and we'd be foolish to offer them anything else." Five years ago he drew all his stock from this province, but now he did not want to see an Ontario potato in his stock. His chief objection to Ontario stuff was that farmers and shippers in loading cars did not keep the different varieties separate; they never graded their stock to size, they simply filled the car with anything and everything that looked like a potato, and never seemed to care whether or not a buyer ever went back for another load. It is impossible too, to buy very many carloads in an average Ontario town, usually one or two cars cleaned up the available supply. From New Brunswick, on the other hand, more than one variety was seldom shipped, and they were never mixed in the same car. The shippers or farmers graded to size, and their goods were always pretty free from dirt. He could depend on the quality of every potato from New Brunswick and could send orders down to lots of towns in that province and get a car a day all season. Mr. Ryan, professed favor for Ontario potatoes on purely patriotic principles, and would prefer spending his money in his own province, but there was no longer any use offering Ontario stock in Toronto. He had sold to a number of farmers at Uxbridge, the Delaware potato for seed last year, and from some had bought the resulting crop at an average of fifteen cents per bag more than market prices for Ontario's. He believed this variety would thrive well here, and if properly attended to produce potatoes of a quality equal to Maritime goods.

Mr. Vance, of Vance and Company, dealt heavily in potatoes and got his entire stock from New Brunswick, from a certain small district in that province of which Woodstock was the center. The Delaware was the only variety he used. He had handled a couple of cars of Michigan's (Rural New Yorkers) this season but preferred the Delawares to anything else he could get. This variety of potato seemed to exactly fill the requirements of the Toronto market. Mr. Vance attributed the general good satisfaction these Eastern goods gave, to the fact that the farmers down there are specializing in potato growing, many of them depending on this crop entirely for the greater part of the revenue of their farms. The three largest potato producing counties in New Brunswick are Carleton, Victoria and York, adjoin the county of Aroostock, Maine. This county for a great many years, together with the Canadian counties beside it, have been supplying the potato trade of the large American Atlantic cities, Philadelphia, Boston and New York. These growers have learned how to grow good potatoes and shippers have had foresight enough not to ship dirty, rotten, small, ungraded goods. Because of a glut in the American market about five years ago these

New Brunswickers lost their old market and turned to Quebec and Ontario. Here the superior quality of their goods, their superior knowledge of the potato business, quickly enabled them to drive out all competition in the potato markets of Quebec and Ontario, but particularly of Montreal and Toronto. It is now about five years since these potatoes came regularly into the markets of Toronto. At about the same time the blight began to work its ravages in the Ontario crop. The Eastern potatoes came in a clean state free from rot in car lots of one variety, graded to size, and had no difficulty in capturing the market here. At present people do not want Ontario potatoes at any price. They've got accustomed to the large white article shipped in by the Maritime grower and do not care to invest their money in the rather too seedy looking Ontario goods.

Railroads too, Mr. Vance maintained, aided the Maritime shipper. Last year the C.P.R. company put in 200 specially designed and specially constructed potato cars, for this trade alone. In this connection we might note ourselves, that in freight rate the New Brunswick shipper has in proportion to the length of haul a very decided advantage. It costs the Eastern shipper 22 cents per cwt. for the 800 mile haul from Woodstock to Toronto, and an additional one cent per hundred in Toronto to cover rebilling, will freight the goods to any point in Western Ontario. The New Brunswick shipper gets a freight rate of 23 cents per hundred for the 980 mile haul from Woodstock, N.B. to Chatham, Ontario. The shipper, say up at Orangeville, pays 13 cents per hundred for hauling the same goods 170 or 180 miles to the same point.

Mr. Vance estimates that from 1,000 to 1,200 carloads of Maritime potatoes come into Toronto every year. At present these cars will average \$500.00 or \$600.00 each. He believed that the bulk of this trade could be kept in Ontario, but farmers would have to discard most of their present varieties, which seem run out and undesirable in many ways, and start with fewer varieties and of a type demanded by the market. That is the potato must be large in size, white in color, thin in the skin, and free from rot and scab. He believed the Delawares could be grown here quite as successfully as in New Brunswick.

Most of these commission people talk about the use of commercial fertilizers on potatoes, and attribute these Eastern peoples success to the use of these manures. Mr. Vance has visited the New Brunswick potato districts at all times of the year and found that growers manured more heavily, cultivated their crop more thoroughly and more frequently than here. They sprayed for both blight and bugs, handled their crop almost entirely by machinery as they experience the same labour difficulties there as here. The great potato district of New Brunswick, lay between Burton and Bath, in a narrow strip about 40 miles long and from 3 to 10 miles wide. At almost any station in this district he could get together any number of cars of potatoes at any season of the year. Farmers there sold by the barrel, a barrel containing about two bags. At present, (March 15) they were selling in New Brunswick at these shipping points for \$1.25 per bbl. and in Toronto for \$1.15 per bag. The lowest price paid growers there in the past five years has been 65 cents per barrel.

Mr. Vance emphasized the point that potatoes should be sold according to variety instead of any old way as at present. It would be impossible, he pointed out, to mix all varieties of apples together and get for them a price equal to that gotten for fruit that was separated out one variety from another. The same was true of potatoes, and the different varieties of potatoes differed in character and quality quite as widely as the different varieties



of apples. Different varieties differed from each other in the length of time to cook, in mealiness, in colour and in taste and where a number of kinds were mixed as satisfactory results could not be obtained as where one variety alone was used.

White & Co., McWilliams & Everist, Cleghorn, Barret, Bailey, Bamford, Thompstone, Robt. Hay Co., and other dealers were spoken to on this subject, and expressed opinions similar to those given above in Mr. Ryan's and Mr. Vance's remarks.

It might be interesting here and in this connection to quote prices paid for Ontario and New Brunswick stock in Toronto market during the past year or two. The figures are taken from *The Weekly Sun* and from *The Farming World*:

Date	Ont.	N. B.	Date	Ont.	N. B.
Jan. 2, 1905	.60 cents	.70 cents	Mar. 15, 1906	.70 cents	.80 cents
" 15, "	.70 "	.80 "	April 1, "	.70 "	.80 "
Feb. 1, "	.70 "	.80 "	" 15, "	.80 "	.90 "
" 15, "	.70 "	.80 "	May 1, "	.90 "	\$1.00 "
Mar. 1, "	.70 "	.80 "	" 15, "	.95 "	1.10 "
" 15, "	.70 "	.80 "	June 1, "	.85 "	1.00 "
April 1, "	.70 "	.80 "	" 15, "	.80 "	1.00 "
" 15, "	.60 "	.60 "	July 1, "	\$1.05 "	1.15 "
May 1, "	.60 "	.70 "	Sept. 15, "	.90 "	
" 15, "	.60 "	.70 "	Oct. 1, "	.65 "	
June 1, "	.50 "	.60 "	" 15, "	.65 "	
" 15, "	.50 "	.60 "	Nov. 7, "	.60 "	.70 "
July 1, "	.50 "	.65 "	" 20, "	.75 "	.85 "
" 15, "	\$1.25 "		Dec. 1, "	.70 "	.80 "
Aug. 1, "	1.25 "		" 15, "	.70 "	.75 "
" 15, "	1.20 "		Jan. 1, 1907	.60 "	.70 "
Sept. 1, "	.90 "		" 15, "	.70 "	.80 "
" 15, "	.75 "		Feb. 1, "	.70 "	.80 "
Oct. 1, "	.65 "		" 15, "	.70 "	.80 "
" 15, "	.75 "		Mar. 1, "	.75 "	.85 "
Nov. 1, "	.70 "	.80 "	" 15, "	.85 "	\$1.00 "
" 15, "	.70 "	.90 "	April 1, "	.85 "	1.10 "
Dec. 1, "	.65 "	.80 "	" 15, "	.90 "	1.10 "
" 15, "	.65 "	.80 "	May 1, "	\$1.00 "	1.15 "
Jan. 1, 1906	.65 "	.80 "	" 15, "	1.00 "	1.20 "
" 15, "	.70 "	.80 "	June 1, "	1.10 "	1.20 "
Feb. 1, "	.70 "	.80 "	" 15, "	1.15 "	1.35 "
" 15, "	.70 "	.80 "			
Mar. 1, "	.70 "	.80 "			

Average difference in favor of N.B. goods since Jan. 1st, 1905—12 cents per bag.

### Hamilton.

*Quantity required.* From 300 to 400 bags per day.

*Quality desired.* Hamilton requires practically the same quality of potato as Toronto, but consumers do not discriminate as closely. Large sized, white potatoes, shallow in the eye and sound are in brisk demand at any time here, but any kind of potato is saleable at some price.

*Source of supply.* Practically all the potatoes used are grown locally or purchased in car lots in Ontario. Not more than 25 cars of Delewares came into this market last year, but Eastern importations are increasing yearly. Ancaster and Barton townships and the districts around Millgrove and Waterdown are the chief producing districts. Farmers around here grow altogether too many varieties. Hamilton is only just beginning to use these Eastern potatoes. She has always been fairly well supplied by the local product, but if the local crop should fail any year to any extent and these New Brunswick Delewares get the market the local stuff is going to be driven out just as it was driven from Toronto.

*London.*

London is estimated to consume about 400 bags per day. Most of the supply is grown locally, the early potatoes by market gardeners adjacent to the city, the winter and fall supply by the farmers of Caradoc, Delaware and London townships. Few potatoes are shipped in from points outside Middlesex county. A few cars of New Brunswicks have been received but did not prove entirely satisfactory. London, it might be said, has the farmers market habit and has it badly, hence consumers buy the great bulk of their supply from the producers' waggons. The Carman is the favorite late variety and all kinds are sold under this name. Dooley is another variety that is largely grown, while Irish Cobbler is a favorite among the earlies. Dealers here complain because there is no legal weight for a bag of potatoes. Any weight per bag may be sold on the market, and many bags do not contain more than 70 pounds.

*Stratford.*

This is not a potato country. Enough is produced locally for the city trade or if sufficient is not grown, a few cars are brought in from Dublin, Strathroy, St. Marys or Orangeville. New Brunswicks are unknown here. Of all the towns and districts in this vicinity and north of here the same may be said. Exeter, Goderich, Clinton, Seaforth, Wingham, Palmerston, Harriston, and all points south of Hepworth produce sufficient for home consumption, but seldom do their towns require to bring anything in.

*Port Hope, Cobourg, Belleville, Kingston, Peterborough, Lindsay and all points and districts in Eastern Ontario excepting Ottawa and surrounding territory.*

Generally speaking, in all these towns and cities sufficient is grown locally to supply local markets, or if importations are required it is generally Ontario stuff that is brought in. A few cars have been shipped out of Cobourg. Last year about 20 cars in all were exported from here. Belleville, Kingston, Peterboro and Lindsay neither bring in stuff or export any. Consumption and production balance fairly well.

Toronto is not by any means the only market of any importance in the province where Ontario grown stock is discriminated against in price, and where Maritime potatoes are favored. All over Ontario these Eastern goods take the market better than our own, but as yet Toronto is the only city that is getting really first class New Brunswick stuff. The people in the smaller cities hav'nt really had a chance to sample the genuine article yet. Now Brunswick potatoes do not all come into the market, true to variety, clean, graded and so on, but the bulk of them do. Now most Toronto potato dealers have an outside trade with country towns and smaller cities. In fact anybody west of Toronto, requiring a load of potatoes, orders it through dealers in this city. They fill such orders with such off quality or mixed stock as is available. Hence it is that everybody in Toronto speaks highly of the Delewares, simply because they're getting the cream of all the stock imported into the province. But when you get out to such places as Petrolea, Sarnia, Chatham or Windsor and examine the goods which dealers there have bought for Delewares, and find that these so called Delewares consist of half a dozen different varieties and don't look half as well as what they were calling New Brunswicks back in Toronto, you'll understand why it is that



outside the Queen City, people do not notice as much difference between the New Brunswicks and Ontario's as they do in Toronto.

But there is a difference, and even these mixed lots reaching the outlying districts, show more quality and are worth more to the consumer than those from Ontario growers. Just at present the average of Ontario potatoes is very much inferior to the average from New Brunswick. They're inferior in almost every thing that goes to make a potato desirable, small, scabby, rotten and lack table quality. Potatoes, by many growers are being produced in Ontario to-day, that are the equal of anything that ever came out of New Brunswick or any place else. But this is the great trouble with the potato business: we don't know how to market our crop after we have it produced. This is the point on which the majority of our growers fail. Farmers do not grade their stock when shipping, and do not seek to improve the quality of the output. They seem to believe that what they're stuffing into the car in the name of potatoes is going out of their district anyway and won't be heard of any more. After a time, that is after a buyer has got caught with such a lot two or three times, he goes elsewhere for his goods, and then the farmers begin to tell you that they can't grow potatoes anymore, that the big markets won't bid on their stuff, that the Eastern potatoes have driven them out; and is it any wonder? Open almost any car of New Brunswick potatoes standing in Toronto yards, remove one of the partition boards that divides the car into two compartments and leaves the little space in the center for the stove and fuel, and the tubers roll out as clean, as even in size as Californian oranges. Examine a load of Ontario's just beside it and you'll find samples of every variety in the province, and tubers of every size, shape, colour, and rot and scab will be in evidence.

Of course all blame for such conditions as these do not rest on the farmer. The shipper is also at fault. One thing about potato shippers is that they're too anxious to do business. Competition has been keener these last few years for potatoes than for any other farm product. To do business dealers take anything and everything offered, knowing that if they attempt to cull or grade the stock farmers would promptly give their trade to some competitor. There is a noticeable lack of co-operation between grower and shipper.

#### POTATO CULTURE.

For the purpose of acquainting ourselves with those methods of potato growing that seem to yield the best results we made a review of much of the literature published in recent years on potato growing. The United States Experiment Stations, have apparently done more in the matter of experimentation in potato growing than has been done by all the rest of the world combined. In most cases the origin of information and quotations will be given.

Potato soils and their preparation for planting: "An ideal soil for potatoes should be one so light as to offer no great resistance to the enlargement of the tubers, so suppled with organic matter as to be rather moist without being wet, and so rich as to furnish an unfailing supply of fertilizing ingredients," says a well known American Experimentalist; and his definition, stripped of its verbosity, simply means that an ideal potato soil is a fertile, sandy loam.

Opinions differ as to what is the best position for potatoes to occupy in the rotation. T. B. Terry, the well known agriculturist and writer, followed for years the practice of a three year rotation of clover, potatoes, and wheat.

Most experiments in this line go to show that clover sod makes about as good a potato soil as any. Early and deep fall plowing of such land, where possible, is advised, and cultivation during the fall will aid in bringing about the decomposition of the sod. If we remember that the potato thrives best in a deep, well drained, moist, mellow cool soil, and give our seed bed such preparation as will best, bring this desired condition about, no matter after what manner the work is accomplished, such a soil will be in the best possible condition for potato growing.

**Manures for Potatoes, Commercial Fertilizers:** When and how to apply manure to a potato soil has been the subject of a vast amount of experimental work and such work has resulted in many contradictory opinions being held on the subject. Best experience however, seems to show that where soil preparation similar to that we have outlined is followed, it is best to apply the farm manure, well rotted is possible, before plowing in the spring. Plow it down three or four inches with a gang plow, and by further cultivation incorporate it, as thoroughly as possible, with the upper six inches of soil. Fresh cow manure is looked upon generally by growers, as being rather dangerous to use because of its tendency to assist in the development of scab. The manure itself may or may not contain that which produces this scabby condition, but its presence in the soil seems in some way to aid in the development of the fungus.

Commercial fertilizers in potato growing can hardly be said to be coming into use as a general rule, though more and more are being sold for this purpose every year. There are a good many acres in the province that are not nowadays, producing anything like the yields that were formerly derived from them. Now this decrease in productiveness may or may not be caused by any deficiency in the essential fertilizing ingredients. It may be due to other causes, quite aside from this, causes which we have elsewhere pointed out. At the same time it should be remembered that the natural tendency in every potato soil is to become depleted of its potash. Potatoes are grown invariably on sandy loam. Such soil even in its state of virgin fertility does not contain anything like such percentages of potash as the clays, and when devoted to potato growing for any length of time tends to become less and less productive. Hence in most potato producing countries the use of potash, and phosphates two, in some commercial form becomes a necessity. Mr. Alva Agee of the Pennsylvania State Board of Agriculture, Harrisburg, Pa., in Bulletin No. 105 of that station discusses this phase of potato growing pretty fully.

The use of commercial plant food in large or small quantities is attended with some financial risk unless all conditions of soil and season are favorable. And even when such favorable conditions prevail, the larger crop secured from the use of these kinds of manures, is not necessarily the most profitable. A grower may imagine that his soil because it is less productive than formerly is deficient in potash, and after investing heavily in fertilizers rich in this ingredient find that he is making no more profit than before. It is a trite statement, but a true one, that each farmer must discover for himself by experiment the fertilizing needs of his farm.

#### SEED SELECTION, TREATMENT FOR SCAB, CUTTING THE SETS.

Authorities differ as widely as it is possible to differ, as to the relative value of large, medium and small seed for planting. Prof. Zavitz, of our own institution, stated, some years ago in summing up the results of his experiments on this point, that he obtained largest and most profitable



yields, year by year, from the use of medium sized seed. American work on the same subject, seems in the majority of cases to bear out results obtained at Guelph. Seed selection is the one phase of potato growing which in altogether too many instances is neglected by the grower entirely. Farmers generally practice a system of seed selection that is positively worse than no system at all. A common method is to plant the small, unsaleable tubers, and it is generally men who follow such methods as these that complain the most about varieties running out, and are under the necessity oftenest of changing seed with their neighbors. Now the planting of small potatoes is not without some merit, and the practice has some foundation in sense. Small potatoes, for example, used for seed, in a dry soil and in a season of continued dry weather will not dry up as rapidly as cuttings from larger tubers, and are likely, in circumstances such as these, to produce a more even stand of vines and a better crop. But planting the small seed should not be practised to any extent even in circumstances such as these.

We hear a great deal in these days about varieties running out. In fact this characteristic has been always regarded as inherent in all varieties. In this connection it might be interesting and not altogether out of place, to consider why it is varieties do run out, and by what system of selection can we not only maintain the strength, vigor and productive qualities of any variety, but at the same time improve that variety in those qualities and characters which it is desirable should be perpetuated. H. L. Bolley Botanist, of the government Experimental Station at Fargo, North Dakota, in Bulletin No. 30 of that Station, takes up pretty thoroughly this running out of varieties, and from a carefully conducted series of experiments concludes that present methods of potato seed selection, even the best of them, are far from being as thorough as they should be.

The different varieties of potatoes are produced in different ways. Some arise from seed selection but most from tuber variation. Some individuals among all plants, and varieties or strains of plants, tend to vary from the standard type of their parent. This tendency among all plants wild or domesticated is altogether too common to require any explanation as to why it should obtain. No two potatoes in any hill or field are identically the same. Both may be the product of the same seed, but they differ from the stock from which they sprung just as they differ one from the other. The natural tendency to run out or degenerate, is simply a wide range of variation from standard type, and in proportion to the extent to which the strain differs from the standard type, in that proportion has it degenerated. It is simply a variation of the crop into certain strains, as for example of smallness, of many tubers to a hill or peculiarities of form that tend to persist from year to year.

"The potato tuber, it is well to remember, does not belong to the root system of the plant, but to the stem. It is not a true seed: that is in the seed ball. It is simply an underground enlargement of the stem consisting of a mass of nutrient materials intended to nourish the buds or eyes when they are ready to commence growth. The tubers, therefore, tend to partake of the nature and characteristics of the plant that produced them. If the plant has been a strong and vigorous one, producing a goodly numbers of strong, well formed tubers, each of these tubers will partake of the characteristics of the parent, and under favorable conditions will produce similar strong plants, while if the plant is weak, setting only a few small tubers and growing them to only medium size, these tubers also will inherit and transmit the characters of the parent plant. A small sized tuber if taken from a hill of large potatoes, though it may be undersized itself, because

it was started late, and did not have time to develop, will possess and transmit the characters of its worthy parent. So also would a fair sized tuber from a weak hill inherit the tendencies of and if used for seed tend to transmit the characters of its parents."

Hence the inspection of the individual tuber alone will not enable us to judge whether or not it inherits vigor and productiveness. Selecting the large or medium sized tubers in the bin, will not with any desired certainty make the crop a better one; for many hills that have produced a great number of tubers off in form or small in size may furnish a large number of the tubers used as seed, for the next crop. Generally speaking since the inherited tendency of the potato is to reproduce not its own individual characteristics but rather the peculiarities of the plant or strain from which it comes, it is very evident that a small tuber from a vine that has borne tubers chiefly of the desired form and size, is of more worth for seed purposes than a very large tuber from a vine that has descended from a strain of vines, that habitually bore numerous, small, undersirable tubers. But because of this growers would be wrong in concluding that small, inferior tubers are as likely to produce as good a crop as large ones. Some times growers for the sake of economy select "seconds" for seed, and sometimes too they are as productive as large ones. But it is well to remember that the good hills produce relatively few seconds, while the poorer hills produce but little else. In every field and in every variety there are always found some weak inferior hills, and in the absence of any system for excluding the product of these from next season's planting, their proportion to the whole is bound to increase, season by season, with a gradual decline in the productivity of the general stock. Ultimately the variety will be said to be "run out."

Seed should be selected at digging time and should be taken from those hills which made the most vigorous growth and produced tubers of standard variety type. The exact manner in which this should be carried out is of minor importance. It is most important to select seed from a plant that has produced a strong vigorous vine and a large number of large sized, well shaped tubers.

Changing the seed to improve the strain in productiveness and vigor has little to commend it. In fact the wisdom of such procedure is neither borne out by experimental results nor based on common sense. W. J. Green in Ohio Bulletin No. 76, 1897, says authoritatively; "We do not find anything in the practice of changing seed, for the mere purpose of securing that which has grown on a dissimilar soil, or in different climate, to commend. It is well enough to change seed, if that can be found which is more carefully selected than your own, or for the purpose of securing an improved variety; but to change from one soil to another may or may not be advantageous."

**TREATMENT OF SCABBY SEED.** Potatoes whether they are treated for scab or not should never be planted in a soil that has produced scabby tubers the year before. In fact the scab fungus may persist in the soil for several years and affect potato crops grown on it. To kill the scab spores on affected tubers, soak them, before cutting, for one and a half or two hours, in a solution of one pint of formalin in 25 gallons of water. This treatment is just as effective as the corrosive sublimate, is more convenient and less dangerous. It costs about 10 cents per acre to so treat potatoes for scab.

**CUTTING THE SEED.** So much experimental work has been done in the matter of testing the value for seed purposes of sets cut from the seed end, the stem end or the middle of the potato, and the results of these experiments are, in many cases so contradictory that it is worse than useless for us to review any part of these voluminous discussions here. A good many



growers in Ontario practice the discarding of the seed end of the tuber. Spear, of Iowa, sums up one side of the case pretty clearly when he says, "Although I have conducted hundreds of potato experiments, I have never noticed anything that would indicate that one end of a potato is better for seed than the other, but potatoes are so often injured by drought, weeds and other unfavorable conditions that it is generally unsafe to plant the seed end." On the other hand, L. R. Taft, of Michigan, whose experience in potato growing is quite as wide as Green's, and whose experiments in these matters are quite as extensive, states with a positiveness quite as conclusive that "the seed end is as valuable for planting as any other portion of the tuber."

This point is not worth further discussion. Generally speaking best results are obtained in potato growing from using large sized tubers for seed, by cutting the sets to a good size with one or two eyes each, by planting these sets 16 inches apart in rows that are 36 inches apart, by covering four or five inches deep and in subsequent cultivation by either hilling up the rows slightly or keeping on the level.

### DISEASES OF THE POTATO.

**PHYTOPHORA INFESTAUS, THE DOWNEY MILDEW OR LATE BLIGHT.** Blight to the ordinary observer makes its first appearance when the vines show a sudden or gradual death about the end of July. But the disease though it was unobserved must have begun at a much earlier date. Until quite recently the theory was generally accepted that the fungus persisted over winter in infected tubers, that these when planted produced in the vines that sprung from them the disease, and that the condition could not very well be induced in any other way. It is a well known fact that it is on infected tubers that the disease first makes its appearance. In spring when these tubers are planted, the mycelium of the fungus pushes out from the diseased on to the healthy tissue, and there forms the temporary spore or reproductive stage, quite similar to that which it later develops on the leaf in July or August, as this stage of the development occurred within a few days after planting and as the disease seldom appeared till two or three months later the problem was to account for the condition of the fungus during that time and the manner in which it induced infection at the later date. To account for this, botanists advanced the theory that the fungus grew directly from the infected tuber planted, into the healthy leaf stalk and secured infection in this way. How all this development could occur, how the fungus could grow all the way up the leaf stem, and leaves, without causing injury or giving evidence of its presence until it is produced, always upon the isolated leaflets, the characteristic black spots of the disease was unexplainable.

Clinton, of the Conn. New Haven Experiment Station, who has probably done more investigation work in connection with *Phytophthora* than any other botanist in America, has advanced the latest and certainly some of the soundest of recent theory in connection with this disease. He believes that infection to the vines comes by contact of the leaves with the ground at the critical wet periods in July and August when the germs of the blight are probably first available in the soil for infection, and that this is not only the usual, but the only method of primary infection.

In support of this statement, Clinton quotes a number of observations and experiments tending to show that the first appearance of *Phytophthora* is on leaflets in contact with the soil. Also that when potatoes are planted in a field that last season suffered from blight, the crop will be affected

earlier and with more serious attack of the disease. That is to say, the old half rotten tubers left in the soil from a previously diseased crop, will, when they are brought into conditions favorable to growth, develop myriads of mycelium and the leaves of the crop coming in contact with this growth in the soil, some of the spores of the disease will gain entrance to the leaflets. Once established within the leaf the mycelium is pushed in among the cells which it breaks down and causes to be brought about that parched up, yellow evil smelling, condition commonly called blight. From this mycelium within the leaf, out through the stomata on the under surface, hyphae, each bearing a number of spores, are borne, and these spores, borne about by various means, are carried to the leaves of healthy plants where they germinate, gain entrance and reproduce the disease. This is called the secondary infection, and is the form in which the disease makes its withering ravages in the potato fields. The spores from these hyphae are carried to the healthy plants in three ways, by rain, by insects and by wind.

1. *Rain*: Moist, "muggy" weather is absolutely essential to the development and spread of blight in the field. Especially is this necessary since the fruiting bodies of the fungus, the spores, are swimming or zoo spores. Moist weather is necessary for infection and warm weather checks its spread, even checks the growth of the mycelium within the leaf. It is believed that the disease cannot develop at all when a temperature higher than 78 degrees F. is reached.

Rain is favorable to the germination of the spores, it serves as an agent of infection by distributing the spores and washing them down into the soil to the tubers. It does not do much in the way of conveying the disease from one plant to another, but it helps to spread it over a plant in which it is already established, and it carries the spores down to the tubers where they readily develop. Produce the well known rotten condition, and perpetuate the fungus over winter.

2. *Wind*: *Phytophthora* is not well adapted to have its spores distributed by wind, though wind may act to some extent as a carrying agent of the spores from one plant to another in the same or in adjacent fields.

3. *Insects*: Insects seem the common agents for distributing *Phytophthora* spores throughout the fields as they are also the chief means of conveying them from one field to another. In other words, were it not for insects, the selection of an isolated field that had not grown potatoes for a number of years, and the use of seed free from rot should give a crop free from blight. From quite a number of experiments concluded at New Haven, Clinton, concludes that insects are among the most active agents in the distribution of blight spores and were it not for them growers could depend upon the isolation of a field as a surety that the crop will not be affected with disease, but that in more isolated fields there is less danger of infection. The common potato bug or Colorado beetle and the flea beetle are among the common insect conveyors of this disease. The potato beetle is especially well adapted for spore conveyance. since the under side of the tarsi of its legs are provided with a stiff brush of hair. Insects too by puncturing the leaves give ready entrance to the developing spore tubes after the disease spores have been deposited on the leaf.

Altogether too little authentic information in reference to potato blight is available. It is not that sufficient literature has not been produced on the subject, but because of the wide difference in the results obtained by different experimenters, and the wide diversity of opinion held by botanists, that it is difficult to give anything that could be regarded as the real status of knowledge in reference to potato blight at the present time. In the above



paragraphs we have quoted largely from the work of Clinton of New Haven Station, Connecticut, U.S.A., whose work on this fungus has been very complete and whose theories in respect to the life history of the organism, its perpetuation one season to another, and the manner in which it affects infection are the soundest and backed by the widest field of observation and experiment of any we have read. A full account of Clinton's work on *Phytophthora* may be found in the Report of the Station for 1905, page 304, and in the Report of 1904, page 363.

**EIGHT WAYS OF PREVENTING OR LESSENING THE SEVERITY OF POTATO BLIGHT:** 1. Spraying with Bordeaux mixture, not simply sprinkling but covering the whole plant with an armour of the mixture, with a thin film of the copper to either prevent altogether the entrance of the spore tubes or so injure their vitality as to render them less able to reproduce the fungus.

2. Obtaining disease resisting varieties. Varieties differ much in their susceptibility to the disease, and those least subject should always be planted.

3. Planting on fresh ground and planting early.

4. Good cultivation and a good rotation.

5. Destroying all refuse of the potatoes.

6. Having good drainage both water and air drainage, near woodlands where air drainage is poor, the disease spreads rapidly in damp, misty weather.

7. Not digging until ten days after the vines die, when a crop has been affected with blight, will lessen the rot among the tubers.

8. Getting the potatoes out of the field as soon as possible after digging and never covering the potato piles with the spore laden vines.

**EARLY BLIGHT**, (*Macrosporium solani*). This disease occurs early in the season in June or July and occurs especially in dry warm weather and in dry situations. It generally attacks the weakest plants first and produces circular brown spots on the leaf. In severe cases where the leaves or large areas of them are killed early in the season, the tubers are naturally small but always sound. *Macrosporium* does not attack the tubers directly and never causes them to rot. It is a much less serious disease than *Phytophthora*, and except for its general appearance and microscopic characteristics but little is known concerning it, its life history or the manner in which it perpetuates season to season. The following are preventives of *Macrosporium solani*.

1. Bordeaux mixture.

2. Selection of vigorous varieties, good tillage and fertilization.

#### SCAB (*Oospora scabies*).

Authorities differ as to whether or not the primary cause of this disease is a fungus. Some maintain that the primary cause of infection of the tubers is bacterial, and that *Oospora scabies* and other organisms follow. A great amount of experimental work has been done on this disease, but no preventive is known if the land is inoculated with the trouble. The best treatment for the seed is to soak in a solution of one pint formalin in twenty-five gallons of water for two hours, or in a solution of corrosive sublimate mixed in proportions of one ounce of the sublimate to eight gallons of water. Either of these treatments is effective; the formalin, though, is most convenient, safest, and cheapest.

Scab fungus can live in the soil at least six years without a known host. Beets, mangolds, and turnips are supposed, also, to be subject to this disease,

but on this point there is lots of room for doubt. It might, however, be safest to keep these out of the rotation.

It is useless to treat scabby seed if it is to be planted on scab-infested ground.

**SPRAYING FOR EARLY AND LATE BLIGHT.** Bordeaux mixture is the standard preventive for these diseases. Spraying with Bordeaux is simply insuring the crop against attack, and the cost is only the premium paid for the surety. Success in using this mixture depends to a large extent upon the care used in mixing the ingredients and to the thoroughness with which it is applied to the vines. If we remember that the ideal way of rendering a plant immune would be to plunge it into a pail of the mixture, so that both surfaces of the leaf and as much of the stem as possible become covered with a spore-proof armor of copper, and try as nearly as possible to duplicate this ideal in spraying, there is small chance of our crop being seriously affected with either late or early blight. Half spraying, however, is little better than none at all. Plants thus treated are not secure, as the disease can spread within the leaf. Bordeaux mixture is not a "cure" for any plant disease. It is only a preventive. Hence spraying after the disease gains a foothold will likely give poor results.

**PREPARATION OF BORDEAUX.** In using Bordeaux it is generally advisable to have stock solutions of the copper sulphate and lime prepared beforehand. The copper requires some time to dissolve, the lime needs to be slaked, and as it is inconvenient to weigh these compounds in this condition, stock solutions of known strength are prepared, and when mixing these finally for use the proportions are got by measuring.

To prepare enough material to spray one acre of potatoes \*four times during the season, proceed as follows: Take thirty-six pounds of copper sulphate (bluestone) and suspend it in a bag or basket near the surface in eighteen gallons of water in a barrel. It is necessary always to suspend the bluestone thus in making a solution. The specific gravity of its solution is greater than that of water. Hence if the copper be thrown in the bottom of the barrel a saturated solution quickly forms around it, which retards or checks dissolution completely. If suspended it becomes soluble in a few hours, and every gallon afterwards dipped from this barrel will contain exactly two pounds of copper. It seems unnecessary to add that the contents of this barrel should always be thoroughly stirred up before anything is dipped from it.

For the lime stock mixture take thirty pounds of fresh quicklime and fifteen gallons of water. Slake the lime by using just as little of the water as possible, and when all is broken down add what remains of the fifteen gallons. A water-tight wooden box will do to slake the lime in and hold the solution, and, if kept covered with water, the solution will retain its strength indefinitely. Every gallon of this solution will now contain exactly two pounds of lime.

In making the Bordeaux those strong stock solutions must never be brought together. Pour three gallons of the copper sulphate solution into a fifty-gallon barrel (an ordinary barrel holds just about fifty gallons); fill this barrel half or three-quarters full of water, add two gallons of the lime solution, fill the barrel up with water, stir thoroughly, and the mixture is ready to use.

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\*It is very rarely necessary to spray oftener than four times during the season. In giving the quantity required for an acre we have allowed for 75 gallons to be applied at each spraying per acre. In actual practice this quantity will rarely be exceeded and in most cases but 50 or 60 gallons will be required. *But be sure to spray thoroughly.*



The four pounds of lime is more than sufficient to neutralize the acid in this weight of bluestone and render it harmless to the leaf. But in case the lime was not very fresh, or had become air-slaked, four pounds might not be enough. A convenient test to determine whether or not the copper has all been neutralized is to add to a little of the mixture a drop or two of a solution of potassium ferrocyanide (yellow prussiate of potash). If this ferrocyanide solution turns brown when it strikes the Bordeaux, more lime should be added. If no change in color occurs when the drop touches the mixture the acid has all been rendered inactive. Paris green, at the rate of half a pound to every fifty gallons of Bordeaux, may be safely added and sprayed on the vines at the same time, as an insecticide.

The time to commence spraying for late blight is about the middle of July, and the object is to keep the vines completely covered with the fungicide from them until all danger of infection from blight spores is past, say, September. A good spray pump is the most effective means of applying the mixture. It is economical of labor, costs only about twenty-five dollars, and will pay for itself in one year if only used on one acre. The special potato sprayers are arranged to spray the vines from below as well as above, and in this way get the mixture on to both surfaces of the leaf. A good many farmers use no special spraying appliances at all, and seem to get satisfactory results from applying the Bordeaux by whatever means are at hand—by sprinkling cans, etc.

#### PROFITS FROM SPRAYING.

On the average, all over Ontario, we believe that the growers who are using Bordeaux are obtaining yields per acre from half to as much again as are obtained from unsprayed crops. We have, however, nothing definite to substantiate this opinion, and will quote here the results of a few experiments covering the point conducted at Geneva, N.Y., during the past two or three years.

No. of sprayings.	1902.		1903.		1904.		Average gain.
	Acre yield.	Gain.	Acre yield.	Gain.	Acre yield.	Gain.	
	bu.		bu.		bu.		
None.....	219	.....	174	.....	153½	.....	.....
3.....	317½	98½	262	88	344½	191	126
5-7.....	342½	123½	292	118	386½	233	158

Owing to the distinct advance in the price of bluestone, and also to the variation in prices in different localities throughout Ontario, an attempt has been made to strike a uniform average in the cost of this commodity to the farmer by writing to the different districts of the Province and ascertaining the cost at each one of these places.

The potato grower, in making use of this report in figuring the cost of spraying with the Bordeaux mixture, should keep this fact in mind, and use our estimates of cost simply as a guide by which to make estimates for his own particular case, substituting the price at which he can buy bluestone for the price which we have used in our estimates, and substituting the price at which he can buy lime for the price used in our estimate, and substituting the cost to him, for the labor of mixing and spraying, for that figure at which it is placed in our estimates.

The cost to spray one acre four times is estimated as follows:

Thirty-six pounds bluestone, at 10c .....	\$3 60
Thirty pounds lime, at 1c .....	30
Labor of mixing spraying four applications per acre .....	1 50
Cost per acre .....	\$5 40

The actual cash gain from such spraying at Geneva for the three years averaged seventy-six dollars per acre per year.

**CULTIVATION OF POTATOES.** After the potatoes are well started, the soil should be cultivated frequently, but shallow, not merely to avoid breaking the roots, but to make a dust mulch in order to retain moisture. One of the best contrivances with which to secure a dust mulch in potato cultivation is to bolt a strong stick across the two hind teeth of the cultivator, first, of course, removing the points. The front teeth are allowed to stir the soil to a depth of one or two inches, and the stick behind smoothes it down, leaving the soil in a much better condition to retain moisture than if thrown up in ridges. This device cannot, of course, be employed very well in the early cultivation of the crop, but if later in the season this tool is used once or twice a week it will aid greatly in conserving the moisture and assist some in aiding the crop to withstand the blight. Since the stick, bolted firmly to the teeth, prevents the widening and narrowing of the scuffer automatically, this device can only be used to advantage where the rows are an even distance apart.

The principal function of cultivation in potato growing is to conserve moisture. Harrowing before the plants are above ground will be found effective. Some growers talk about using the harrow after the plants are up, just as corn is ordinarily harrowed, but we doubt if such practice is ever followed. A weeder is the best implement for first cultivation. After that the scuffer or two-horse cultivator is used. Cultivation should extend right up to the rows. Too many farmers leave a strip of uncultivated soil ten inches or a foot wide, right along the row. If the tubers have been deeply planted—that is, four or five inches deep—there is little likelihood of injuring the plants by close cultivation.

**HARVESTING AND STORING.** A good digger is required where any considerable acreage is grown. Those of the style that dig one row at a time, elevate the soil and potatoes, and by a shaking motion separate the tubers from the earth and tops, give the best general satisfaction. Of these the Hoover is most generally used here in Ontario, and in most cases is well spoken of. Of course, where potatoes are planted deeply and the machine is required to get down beneath the hills and elevate the whole mass, the draft is quite heavy; in fact, four horses are usually required on these machines. The potatoes and soil are carried over a slatted steel platform, which is in motion. This separates the soil from the potatoes, allows it to drop back through the openings, and delivers the tubers separate from the tops, in a row, convenient for picking.

Some care should be taken of potatoes intended for seed, in respect to their storing and subsequent handling. Sprouting and the frequent breaking off of sprouts tends to lessen the vitality of the seed, and consequently the yield per acre. Cellars are not a good place for storing seed potatoes. Pits give much better results. If kept in cellars, shovelling over frequently will check sprouting to some extent, but it is rather laborious.



In the great potato producing districts of Maine, where climatic conditions quite similar to our own have to be contended with, wooden houses, double boarded, with a six-inch dead air space between, are used for this purpose. These houses are built over a cellar, in which a stove is kept going in the coldest weather. Potatoes are stored in bins of several hundred barrels each, and as the walls of these bins do not connect with the inside walls of the house, the air from the cellar below circulates freely, and the temperature, even in the coldest weather, does not get much below 35 or 40 degrees Fahrenheit.

#### NOTES ON VARIETIES.

General characteristics of a few of our common varieties only will be given. It seemed almost certain in a good many instances that came under our notice that seed men or potato growers, or somebody, have been giving new names to old varieties. There is, of course, no positive evidence to warrant anything being said. Evidence of this kind would be very hard to obtain.

*American Wonder.* This is a vigorous, prolific variety; tubers are of good shape and color. It possesses good table qualities, and is a good variety for home or market use.

*Borce.* Color white, with pink markings. A very productive variety. Has a tendency to go "prongy" and set too many tubers.

*Carman, Nos. 1-3.* These are both mid-season white varieties of great merit, are unlike in habit of growth, but the tubers bear a close resemblance. Market qualities good; productive and high in percentage of marketable tubers. Are better for market than home use.

*Great Divide.* A medium-sized, elongated, white potato. Eyes are numerous, but are shallow and not particularly objectionable.

*Irish Daisy.* Tubers considerably elongated, and eyes deep set, making it objectionable. The skin is white. Not much grown in Ontario, though some report it a good yielder.

*Early Sunrise.* A medium-sized, long, white potato. A good cropper, and well adapted to clay loams.

*Boston Market.* A long-shaped, red-skinned potato, shallow eyed. Not a very good producer, and not possessed of No. 1 table qualities.

*Russet.* A variety lately originated. Has a russet-colored scurf or skin, which scrapes off easily when the tubers are soaked in water. Is medium sized, with fairly shallow eyes; is a good cropper and a good cooker.

*Rose of Erin.* This is an extra large, long-shaped, white potato, smooth and free from protuberances. Grows exceptionally large and with few small tubers. It is a little too deep in the eye; is a good sand potato.

*White Giant.* Is believed by some to have originated from Carman No. 3 by selecting the longest shaped tubers. This variety differs in different localities. It is a good table potato and a good producer.

*White Elephant.* Large, long and white, medium to deep in the eye, and inclined to run rough. Seed end is red.

*Beauty of Hebron.* Large, long, and of not quite so clear a white color as the Elephant. This is the most widely grown variety in Ontario.

*Early Harvest.* An elongated potato; white colored, with a yellowish cast. Is about two weeks later than Early Ohio.

*Early Thoroughbred.* A medium-sized, early, long potato; pinkish white in color.

*World's Fair.* A rather "long oval" potato. Its principal characteristic is the rough cast or tinge of the skin. In this respect it closely resembles the Russet. Is a medium potato, fair cropper, and of good table qualities.

*Rochester Rose.* Long shaped, dull white in color, and fairly shallow-eyed. A good general potato.

*Early Ohio.* A long-shaped, reddish-pink potato, the best early potato grown in Ontario. A good cropper, very early, and of exceptionally good table qualities.

*Burpee's Seedling.* A long-shaped, white potato, generally regarded as being fairly free from rot.

*Early Puritan.* An elongated, white-colored potato; not so early as Ohios, and not so good for home use, but a better market potato.

*Early Canada.* This is a mid-season potato, long shaped and white, fairly deep in the eye, pretty smooth, and is a good producer.

*Delaware.* An oval-shaped, white to yellowish potato, well adapted to sandy loams, a good producer, sets few small tubers, and has excellent table qualities.

*Empire State.* An elongated, white potato, medium to deep in the eye, adapted to general soils, and is a good home user. Is one of the most largely grown varieties in Ontario.

*Uncle Sam.* Tubers large, rather long and thick, usually nearly the same diameter the entire length, slightly flattened; ends nearly oval. Eyes shallow, and surface very smooth. Quality fair; vigorous, and prolific. In general appearance the tubers are large and very fine. This is a long-keeping kind.

#### HINTS ON IMPROVING THE POTATO INDUSTRY.

Suggestions as to how the potato industry in Ontario may be improved :

1. By holding special Farmers' Institute meetings in those districts we have mentioned as being the best potato producers, by getting good practical men either from the locality or from a distance to address these meetings and to try by every means possible to get the local men, the growers, interested and to take part in discussions.

2. By making such subjects as potato growing, spraying for the blight, etc., *important* subjects in the list for Institute speakers. Potatoes have been sidetracked in this connection too long.

3. By actually demonstrating, in as many districts as possible each year, the actual operation of making Bordeaux mixture, spraying it on the potato vines and its value as a preventive of disease.

4. By arranging with the experimental department at Guelph, or through the Experimental Union, to conduct actual field experiments in different parts of the province to find whether or not blight may be controlled by Bordeaux, and if so what is the increase in yield per acre, and what does it cost to use that remedy. Farmers as a class will believe Bordeaux is an effective preventive for blight when its value is demonstrated right beneath their noses on their own or their neighbours' farms, the experiments to cover large areas and to be conducted in various parts of the province. Results therefore would be of more general value.

5. By urging upon the farmers, in such districts as potatoes may be successfully cultivated, the advisability of increasing the acreage they are planting to this crop. By getting individuals and ultimately whole districts to specialize in this one thing. In this way more intelligent interest would be shown in potato growing, fewer varieties would be grown and a better



quality of stuff shipped from that district to the market, this work could best be taken up by the Institute.

Of these five suggestions the third is hardly practicable, but the fourth it seems to us ought to, if properly carried out, lead to some improvement in the potato industry. It would help the business along in the very way it should be helped, it would give much more valuable results than could possibly be obtained from small plots, and these results could be used to good advantage in Institute work carried on during the winter. It is only by eternally keeping at the farmers that they can be moved to adopt new ideas. It was through the Institute lectures more than anything else that the bacon industry of Ontario has been brought to its present prosperous condition, and this department can do just as much for the potato grower. Good practical men who know potato growing in all its details are the only men needed for such work.

#### GENERAL SUMMARY.

The world's potato crop in 1904 aggregated 4,297,062,000 bushels. Europe devotes about 40 per cent. of her potato crop to the manufacture of starch and alcohol.

The Germans, of all peoples, are the greatest potato producers and the largest consumers.

In the United States, Maine in proportion to her area devotes the largest acreage to potatoes. Potato growing all over America is becoming more and more of a special line of farming.

Ontario's potato acreage has been decreasing quite steadily for the past ten years, the decrease being due to such causes as the prevalence of blight, the scarcity of labour, the unfavorable weather for some years back, the growing of too many poor low yielding varieties.

In every district and part of Ontario conditions in respect to the industry are practically the same. Farmers are growing too many varieties, they cannot get sufficient help to handle the crop properly with the result that yields are low, the percentage of rot is high and potatoes do not take the market well. The only apparent remedy is for them to invest their capital more and more largely in labour saving machinery, grow few varieties, select their seed more intelligently, spray with insecticides to control insects, and fungicides to prevent the blight.

Toronto consumes from 2,000 to 3,000 bags of potatoes per day and, roughly speaking, draws 80 per cent. of this supply for 9 months of the year, from New Brunswick. In other Ontario cities the N.B. potatoes are not so generally used, but it is only a question of a few years till they will be consumed just as largely in most western cities as they are now used in Toronto. The marketing of a better class of stuff on the part of the Ontario producer is the only way in which the trade can be retained.

It costs 23 cents per hundred pounds to ship potatoes 980 miles from Woodstock, N.B., to Chatham, Ontario. It costs the Orangeville shipper 13 cents per hundred to have his car lot hauled 170 miles to the same point.

The average market difference between N.B. and Ontario potatoes from Jan. 1st, 1905, to June 15th, 1907, was 12 cents per bag.

New Brunswick potatoes are preferred in all markets because they average larger in size, are clean, free from rot or scab, carloads are of one variety only and the table qualities of that one variety cannot be equalled.

Ontario potatoes are discriminated against because they usually contain a large percentage of small tubers, are liable to be infected with rot or scab, and carlots contain too many varieties.

Sandy loam, well drained and early makes the best potato soil. Clover sod deeply fall plowed is the best soil preparation.

Farm yard manure should be applied to this soil in the spring, in a well rotted condition and thoroughly cultivated in.

Commercial fertilizers are not ordinarily required, but if the land seems improductive some form of commercial manure may be applied after the grower has experimented sufficiently with the different fertilizers to know what the requirements of his soil were.

The best way to select stock for seed is to take the tubers from the strongest, most vigorous plants. Plants that have produced potatoes large in size, numerous, and true to variety type, taking seed from the whole crop is a very haphazard method. It is the great cause of varieties running out.

There is nothing to commend in the practice of changing seed.

Scabby seed should be treated with formalin and never planted in a soil that has produced scabby tubers within the past six years.

It makes no difference whether sets are cut from the seed end, the stem end or the middle of a tuber.

*Phytophthora infestans* (late blight) and *Macrosporium solani* (early blight) are the two commonest potato diseases. Both may be controlled by Bordeaux after the formula, 6 lbs. bluestone, 4 lbs. lime in 50 gallons of water. For the late blight commence spraying July 15th, for the early blight about the middle of June. The early blight is rarely very prevalent.

Spraying with Bordeaux costs from five to eight dollars per acre, the actual cash gains from such spraying at Geneva, N.Y., for the past three years averaged \$76.00 per acre per year.

Cultivation of potatoes should be frequent and shallow. Its principal purpose is the conservation of moisture. Digging where large acreages are grown can now only be performed by machinery. The Hoover digger is the most satisfactory used in Ontario.

Potatoes intended for seed should be stored in a cool place that the buds may be kept from sprouting, as sprouts that grow out and are broken out decrease the vitality of the tuber.

The potato industry in this province is well worth more attention than it now receives and the Department of Agriculture, through its Farmers' Institute system, directly, and through its Experimental Station should endeavour to do something to bring about improvement.

It is by education alone that the growers can be made to produce a better article than they are producing at the present time, and in proportion to the "closeness" with which we can carry that instruction to the growers in the same proportion will be the success of the undertaking.



## THE POTATO CROP OF ONTARIO FOR 1906.

The following table, taken from the Annual Report of the Bureau of Industries, shows by counties, the area, yield and market value of the Potato crop of 1906 in Ontario. It also gives the statistics for the last ten years with the average for the 25 years 1882-1906.

Counties and Districts.	Acres.	Bushels.	Bushels Per acre.	Market value.
				\$
Algoma, Thunder Bay and Rainy River..	1,744	254,624	146	136,987
Brant .....	2,364	290,772	123	156,435
Bruce .....	3,344	448,096	134	241,076
Carleton .....	3,662	465,074	127	250,210
Dufferin .....	2,227	207,111	93	111,426
Dundas .....	1,974	238,854	121	128,504
Durham .....	2,498	299,760	120	161,271
Elgin .....	2,733	333,426	122	179,383
Essex .....	3,097	300,409	97	161,620
Frontenac .....	3,760	406,080	108	218,471
Glengarry .....	2,032	219,456	108	118,067
Grenville .....	2,682	329,886	123	177,479
Grey .....	5,105	704,490	138	379,016
Haldimand .....	1,288	113,344	88	60,979
Haliburton .....	598	60,996	102	32,816
Halton .....	1,428	145,656	102	78,363
Hastings .....	4,657	512,270	110	275,601
Huron .....	3,446	441,088	128	237,305
Kent .....	3,149	349,539	111	188,052
Lambton .....	3,038	297,724	98	160,176
Lanark .....	2,201	319,145	145	171,700
Leeds .....	2,901	371,328	128	199,775
Lennox and Addington .....	3,240	349,920	108	188,257
Lincoln .....	1,997	171,742	86	92,397
Manitoulin .....	513	66,177	129	35,603
Middlesex .....	5,174	600,184	116	322,899
Muskoka .....	1,089	143,748	132	77,336
Nipissing .....	1,078	121,814	113	65,536
Norfolk .....	2,890	280,000	100	150,640
Northumberland .....	4,153	415,300	100	223,432
Ontario .....	3,475	337,075	97	181,346
Oxford .....	2,676	329,148	123	177,082
Parry Sound .....	1,248	194,688	156	104,742
Peel .....	2,909	258,901	89	139,289
Perth .....	2,984	393,888	132	211,912
Peterborough .....	2,664	301,032	113	161,955
Prescott .....	2,762	317,630	115	170,885
Prince Edward .....	1,964	163,012	83	87,700
Renfrew .....	3,461	467,235	135	251,372
Russell .....	1,227	184,050	150	99,019
Simcoe .....	7,146	771,768	108	415,211
Stormont .....	1,825	235,425	129	126,659
Victoria .....	2,457	196,560	80	105,749
Waterloo .....	2,837	295,048	104	158,736
Welland .....	2,852	245,272	86	131,956
Wellington .....	4,107	369,630	90	198,861
Wentworth .....	3,359	309,028	92	166,257
York .....	6,139	392,896	64	211,378
The Province .....				
1906 .....	136,064	15,020,299	110	8,080,921
1905 .....	132,530	14,366,049	108	6,608,383
1904 .....	133,819	15,479,122	116	7,847,915
1903 .....	139,011	16,676,447	120	7,354,313
1902 .....	144,733	12,942,502	89	7,312,514
1901 .....	154,155	18,116,637	118	7,717,687
1900 .....	163,754	21,476,439	131	5,605,351
1899 .....	168,148	19,933,366	119	6,538,144
1898 .....	169,946	14,358,625	84	6,332,154
1897 .....	169,333	16,100,797	95	6,424,218
1882-1906 (average of 25 years) .....	155,406	17,837,505	115	7,338,880

## COMPOSITION AND COOKING QUALITIES OF POTATOES.

REPORT OF EXPERIMENTS CONDUCTED BY PROF. R. HARCOURT, O.A.C.,  
GUELPH, ONT.

To secure data showing what difference, if any, there is in the composition of potatoes grown in Ontario and in the Maritime Provinces, we have collected, analyzed, and determined the cooking quality of eighty-one samples of potatoes, fifty-three of which were grown in this Province, and twenty-eight in the Eastern Provinces.

All the potatoes, with the exception of samples Nos. 78, 79, 80, and 81, were sent to us by persons with whom we corresponded, and who were made familiar with the object of the work. The four above mentioned samples were Maritime Province potatoes secured on the open market. In soliciting samples we asked for the name of the variety and a statement of the nature of the soil in which they were grown. Unfortunately, this information was not always given, but, so far as can be ascertained, the soil was in nearly all cases a sandy or sandy loam. The data received are incorporated in Table No. 1. The same table also contains a record of the cooking quality of these potatoes. In carrying out this test a comparatively small sample of each lot was boiled separately in small saucepans, and the marks for flavor, mealiness, and appearance, which are given in the following table, were allotted by three of the teachers of the Macdonald Institute. In a few cases the original sample was so small that after preparing a sample for analysis there was not enough left for the cooking test. Where no marks were given for appearance, the boiled potatoes were so dark in color or black and hollow in the centre that no marks could be given on this point. This may or may not be characteristic of the variety, but these potatoes were very bad in this respect.

The investigation was undertaken rather late in the season, and, as samples for analysis were prepared first, the cooking tests were not made until the latter part of April. Consequently, they were made at a time more favorable for the late than for the early varieties. An attempt was made to separate the varieties into early, medium, and late, but it was found that no such classification could be made that would be perfectly satisfactory. For some few years past a record has been kept by the Experimental Department of the Ontario Agricultural College of the number of days required to mature different varieties. But as potatoes, like other crops, mature one season faster than in another, it would not be fair to compare the days required to ripen one variety of potatoes one year with a different variety another year. An average of past records cannot be got for all the varieties on this list; because, while some of them are still being grown on the Experimental Plots, others were discarded years ago, and others are just being brought into the comparative test work. Consequently, the figures showing the number of days required to mature those varieties which were grown on the Experimental Plots in the year 1906 only are given. For these figures I am indebted to Prof. Zavitz, who has charge of the field experimental work.

When we remember that the cooking tests were made late in the season, we are not surprised to find that there are very wide differences in the number of marks allotted the various samples for quality. Twelve samples, six grown in Ontario and six in the Maritime Provinces, received over 85 points; but one-fourth of the total number fall below the 50 mark and six below 20. The average total score of the forty-nine Ontario samples cooked is 59.6, and of the twenty-six Eastern samples is 66.7.



TABLE No. 1. TABLE SHOWING SOURCE OF POTATOES EXAMINED AND THEIR COOKING QUALITY.

Varieties	Soil	*No. of days in reaching maturity	Flavor 40 points	Mealiness 40 points	Appearance 20 points	Total 100 points
POTATOES GROWN IN ONTARIO.						
<i>From Experimental Department, O.A.C.</i>						
1. Rose of the North.....	Loam.....	95	29	18	†.....	.....
2. Carman No. 1.....	".....	103	29	32	16	77
3. Early Andes.....	".....	90	35	37	18	90
4. Holborn Abundance.....	".....	105	35	38	18	91
5. Stray Beauty.....	".....	87	12	16	10	38
6. Snider.....	".....	88	20	16	12	48
7. Robertson's Champion.....	".....	103	10	2	5	17
8. Early Dawn.....	".....	89	28	33	15	76
9. Empire State.....	".....	101	33	33	17	83
10. Dempsey's Seedling.....	".....	101	30	28	12	70
11. Burpee's Early.....	".....	99	15	20	7	42
12. Early Fortune.....	".....	89	29	32	17	78
13. Early Pinkeye.....	".....	87	29	25	17	71
<i>From J. Hewer &amp; Sons, Guelph.</i>						
14. Early Harvest.....	.....	.....	25	37	15	77
15. Irish Cobbler.....	.....	.....	13	25	15	53
16. Eureka.....	.....	.....	22	25	16	63
17. American Wonder.....	.....	.....	16	18	14	48
<i>From Chittick &amp; Co., Guelph.</i>						
18. Caledon East.....	.....	.....	35	37	16	88
19. Early Immigrant.....	.....	.....	18	26	14	58
20. American Beauty.....	.....	.....	25	34	16	75
<i>From Rennie &amp; Co., Toronto.</i>						
21. Earliest Six Weeks (Grown in York Co.).....	.....	90	.....	not	cooked	.....
22. Early Sunlight (Grown in York Co.).....	.....	100	.....	"	"	.....
23. Gold Coin (Grown in Muskoka).....	.....	101	.....	"	"	.....
24. Irish Cobbler (Grown in Muskoka).....	.....	.....	30	26	15	71
25. Queen of Hebron (Grown in Muskoka).....	.....	.....	30	38	19	87
<i>From Steele, Briggs Seed Co., Toronto.</i>						
26. Irish Cobbler.....	.....	.....	22	36	17	75
27. Early Sunlight.....	.....	100	20	15	12	47
28. Delaware or Green Mountain (N.B. Stock).....	.....	.....	7	5	4	16
29. Early Ohio.....	.....	88	17	25	13	55
30. Favorite Potato (N.B. Stock).....	.....	.....	13	15	12	40
<i>From Simmers &amp; Co., Toronto.</i>						
31. New Brunswick Hebron (Ontario stock).....	.....	.....	26	39	17	82
32. Early Ohio.....	.....	88	26	26	10	62
33. Delaware or Green Mountain.....	.....	.....	10	38	20	68
34. Envoy.....	.....	.....	29	18	10	57
35. Rose of the North.....	.....	95	25	18	13	56

\* Number of days in reaching maturity at the Experimental Department, Ontario Agricultural College, for the year 1906.

† Scoring of appearance overlooked.

TABLE NO. 1.—*Continued.*

Varieties	Soil	*No. of days in reaching maturity	Flavor 40 points	Mealiness 40 points	Appearance 20 points	Total 100 points
<i>From Robert Thompson, St. Catharines.</i>						
36. Naught Six.....	Sandy loam.....	96	39	35	15	89
37. Delaware.....	Light sand.....		29	30	16	75
38. American Wonder.....	" ".....	99	25	8	4	37
39. Ohio.....	Dark sandy loam.....		15	15	15	45
40. Gold Coin.....	Dark sandy loam.....	101	20	15	7	42
41. Gold Coin.....	Gravelly loam.....	101	20	20	10	50
42. American Wonder.....	Dark sandy loam.....	99	15	25	14	54
43. Green Mountain.....	Dark sandy loam.....		15	20	18	53
44. Naught Six.....	Dark sandy loam.....	96	14	35	14	63
45. Carman No. 3.....	Sandy loam.....		10	10	7	27
46. Rural New Yorker.....	" ".....	101	20	26	14	60
47. Great Northern.....	Dark sandy loam.....		25	22	5	52
<i>From Bruce &amp; Co., Hamilton.</i>						
48. Sir Walter Raleigh.....		97	20	30	9	59
49. Norton Beauty.....		84	5	5	10	20
50. Bovie.....		93	12	25	9	46
51. Pride of Aristook.....			38	39	13	90
52. Gold Coin.....		101	36	26	19	81
53. Bruce's Early Beauty.....			5	6	5	16
POTATOES FROM MARITIME PROVINCES.						
<i>From Shediac, N.B.</i>						
54. Surprise.....		101	8	6	0	14
55. White Queen.....			33	33	16	82
56. Early Rose.....		94	26	28	15	69
57. Coppers.....				not cooked		
58. Silver Dollars or Jacksons.....			12	33	16	61
59. Jacksons.....	Very sandy loam.....		30	16	14	60
60. Dakota Reds.....	".....		sample	not cooked		
61. Delaware.....	".....		10	38	20	68
<i>From Sussex, N.B.</i>						
62. No Name.....			33	34	17	84
63. Green Mountain.....			33	33	18	84
64. No Name.....	Sandy.....		28	34	11	73
65. No Name.....			5	31	18	54
66. Early Rose.....	Sandy loam.....	94	14	38	12	64
<i>From Truro, N.S.</i>						
67. Bliss Triumph.....	Medium loam.....	90	20	30	12	62
68. Elephant.....		99	39	39	18	96

\* Number of days in reaching maturity at the Experimental Department, Ontario Agricultural College, for the year 1906.



TABLE NO. 1.—*Continued.*

Varieties	Soil	*No. of days in reaching maturity	Flavor 40 points	Mealiness 40 points	Appearance 20 points	Total 100 points
<i>From Truro, N.S.—Continued.</i>						
69. Early Surprise (Grown in P.E.I.)	" "	.....	34	39	18	91
70. McIntyre's (Predominating variety grown in P.E.I.)	Heavy loam.	.....	19	33	0	52
71. Name Unknown.	Heavy clay loam.	.....	34	39	14	87
72. New Queen (Truro, N.S.)	Sandy loam.	101	35	25	15	75
73. Home Comfort (Truro, N.S.)	" "	.....	38	38	17	93
74. Vick's Perfection	Heavy clay loam.	.....	39	30	17	86
75. Clark's No. 1.	Heavy clay loam.	.....	10	3	5	18
76. Burpee's Ex. Early	.....	99	27	16	17	60
77. Early Vermont	.....	.....	30	39	18	87
<i>New Brunswick Potatoes sold in Petrolea, Ont.</i>						
78. Delaware	.....	.....	5	15	10	30
79. Delaware	.....	.....	10	30	20	60
<i>N. B. Potatoes sold in Sarnia.</i>						
80. Early Ohio	.....	.....	8	15	22	45
81. No Name	.....	.....	15	36	28	79

It was thought that possibly the longer maturing or later varieties of potatoes would show the best quality when coked. But, while the highest scores were given varieties which took a comparatively long time to reach maturity, some of these received very low marks. Samples Nos. 2 and 7 illustrate this. Both took 103 days to mature; one was given a total score of 77 marks and the other 17. Both of these varieties were grown on the Experimental Plots, where the conditions of soil, cultivation, and general treatment were alike. On the other hand, none of the varieties which matured in less than ninety days received very high total marks.

#### COMPOSITION OF POTATOES.

In preparing the potatoes for analysis, they were carefully washed and dried sufficiently to remove all adhering moisture, and then a 500 gram sample was sliced very thin and dried at a low temperature until crisp enough to grind to a fine powder. This sample was then placed in an air-tight bottle and used as occasion required for analysis. Some preliminary work showed that the potatoes contained about .5 per cent, of sugars of all kinds, and that there was very little variation in the amount of these substances. The per cent. of fat was also found to be very small—about .1 per cent., and fairly constant. In view of these facts it was decided to spend very little time on the study of the proportionate amount of these constituents, but to devote the time to the determination of the starch, proteids, and ash, which form the most abundant constituent of the dry matter of the potatoes.

\* Number of days in reaching maturity at the Experimental Department, Ontario Agricultural College, for the year 1906.

The proteids were determined by ascertaining the amount of nitrogen and multiplying it by the factor 6.25 to convert to proteids. The ash was got by burning to a white ash in platinum dishes, and the water by estimating the loss in weight during the drying of the sliced potatoes, and finally by drying in a water oven in the presence of a reducing gas. The estimation of starch was made by boiling the dry potato meal in acid and determining the amount of reducing substances by means of Fehling's solution, according to the Association of Official Agricultural Chemists' Methods. It is evident that this method of procedure will not allow of the estimation of pure starch, and that the figures secured really include all reducing carbohydrate bodies present, and, possibly, some other bodies that reduce Fehling's solution. As the substances other than the hydrolized starch that will come into the reaction are comparatively small, it was thought that at least comparable results would be obtained. The undetermined matter includes fat and crude fibre, along with other undetermined substances. All the analyses were carefully made, and where results differing widely from others were obtained the work was repeated, no matter how well the duplicates agreed.

## COMPOSITION OF POTATOES.

GROWN IN ONTARIO.

In Natural Condition.						Figured to Dry Matter.			
No.	Moisture	Protein	Starch	Ash	Undet. Matter	Protein	Starch	Ash	Undet. Matter
1	79.92	2.02	13.22	.93	3.91	10.06	65.83	4.63	19.48
2	78.91	1.98	14.07	.97	4.07	9.39	66.71	4.60	19.30
3	77.77	2.48	13.95	.94	4.86	11.15	62.75	4.24	21.86
4	77.56	1.76	15.17	1.04	4.47	7.84	67.60	4.63	19.93
5	83.59	2.30	9.57	.93	3.61	14.01	58.31	5.67	22.01
6	82.19	2.57	11.54	.70	3.00	14.43	64.79	3.93	16.85
7	77.53	2.17	14.81	1.13	4.36	9.65	65.91	5.03	19.41
8	81.52	2.32	12.29	.99	2.88	12.56	66.50	5.35	15.59
9	80.12	2.00	13.02	.91	3.95	10.01	65.49	4.58	19.92
10	78.83	2.29	14.05	.91	3.92	10.81	66.37	4.29	18.53
11	79.76	1.96	14.22	.89	3.17	9.68	72.57	4.39	12.36
12	80.09	2.33	13.32	.82	3.44	11.70	66.90	4.12	17.28
13	82.84	2.39	10.38	.94	3.45	13.93	60.05	5.48	20.54
14	77.51	2.49	16.79	.84	2.37	11.08	74.21	3.73	10.98
15	78.50	2.21	16.13	.93	2.23	10.28	75.02	4.32	10.38
16	79.43	2.23	15.04	.91	2.39	10.84	73.11	4.42	11.63
17	79.24	2.24	14.33	.82	3.37	10.79	69.02	3.95	16.24
18	79.67	2.09	14.95	.95	2.34	10.23	73.53	4.67	11.57
19	77.24	2.05	16.96	.93	2.81	9.01	74.51	4.57	11.91
20	79.05	1.90	15.29	.84	2.92	9.07	72.98	4.01	13.94
21	81.39	2.46	13.17	.92	2.06	13.22	70.76	4.95	11.17
22	79.54	2.70	14.63	1.01	2.12	13.19	71.51	4.45	10.85
23	79.36	2.28	14.71	.97	2.68	11.04	71.27	4.70	13.99
24	80.05	2.32	14.02	.94	2.67	11.63	70.28	4.71	13.38
25	78.05	1.98	16.39	.81	2.77	9.02	74.67	3.69	12.62
26	80.06	2.14	14.57	.97	2.26	10.73	73.07	4.86	11.34
27	80.53	2.32	14.30	1.01	1.84	11.92	73.45	5.19	9.44
28	76.16	2.77	17.65	.69	2.73	11.62	73.66	2.94	11.78
29	79.45	2.42	14.43	.87	2.83	11.77	70.22	4.23	13.78
30	80.94	1.91	13.25	.83	3.07	10.02	69.51	4.35	16.11
31	73.60	1.80	19.83	.88	3.89	6.82	75.11	3.34	14.73
32	79.79	2.20	14.55	.86	2.60	10.89	71.94	4.25	12.92
33	80.48	1.92	14.03	.86	2.71	9.84	71.87	4.40	13.89
34	79.35	2.30	14.72	.91	2.72	11.13	71.28	4.41	13.18
35	79.33	2.47	14.51	.81	2.78	11.47	70.02	3.91	14.60



COMPOSITION OF POTATOES—*Continued.*

In Natural Condition.						Figured to Dry Matter.			
No.	Moisture	Protein	Starch	Ash	Undet. Matter	Protein.	Starch	Ash	Undet. Matter
36	76.90	2.18	17.71	.82	2.39	9.43	76.75	3.55	10.27
37	80.56	2.17	13.65	.97	2.65	11.16	70.22	4.98	11.16
38	79.92	1.80	14.25	.85	3.18	8.96	70.97	4.23	15.48
39	82.60	2.40	11.58	1.01	2.41	13.79	66.55	5.81	13.85
40	79.29	2.93	14.03	.88	2.90	14.15	67.75	4.25	13.85
41	81.96	2.21	12.28	.91	2.64	12.92	68.07	5.04	13.97
42	78.20	2.36	15.88	.97	1.59	10.82	72.89	4.45	11.84
43	80.88	2.88	13.23	1.02	1.99	15.06	69.20	5.33	10.41
44	76.26	2.75	16.17	1.02	3.80	11.58	68.11	4.34	15.97
45	80.47	2.49	13.30	.98	2.76	12.75	68.60	5.02	14.63
46	80.48	2.67	14.46	.79	1.70	13.68	74.08	4.05	8.19
47	79.75	2.24	14.43	.83	2.75	11.06	71.26	4.10	13.58
48	77.37	2.87	16.50	.91	2.35	12.24	72.42	4.02	11.32
49	81.44	2.30	12.82	.99	2.45	12.39	69.08	5.33	13.20
50	80.37	2.43	13.89	.78	2.53	12.43	70.76	3.97	12.84
51	77.52	2.50	16.64	.93	2.41	11.12	74.02	4.13	10.73
52	78.01	2.29	16.15	.94	2.66	10.41	72.53	4.23	10.41
53	78.07	2.01	15.90	.78	3.24	9.17	72.50	3.56	14.87
Mini- mum.	73.60	1.76	9.57	.69	1.70	6.82	58.31	2.94	8.19
Maxi- mum.	83.59	2.93	19.83	1.13	4.86	15.06	76.75	5.81	22.01
Aver- age.	79.42	2.29	14.47	.90	2.92	11.21	70.14	4.44	14.21

## GROWN IN THE MARITIME PROVINCES.

54	79.16	1.78	14.78	.87	3.41	8.53	70.92	4.17	16.38
55	73.73	2.05	20.03	.85	3.34	7.42	76.25	3.24	13.09
56	75.37	2.93	18.41	.87	2.41	11.90	74.74	3.53	9.83
57	73.92	2.75	20.05	.73	2.55	10.54	76.88	2.80	9.78
58	77.61	2.15	16.79	.97	2.48	9.60	74.99	4.33	11.08
59	79.36	2.11	14.83	.75	2.95	10.22	71.84	3.63	14.30
60	75.48	2.40	18.65	.79	2.68	9.78	76.06	3.22	10.93
61	74.94	2.59	19.56	.81	2.10	10.33	78.06	3.23	8.38
62	77.58	2.11	16.84	.96	2.51	9.41	75.11	4.29	11.18
63	75.56	2.13	18.62	.82	2.87	8.71	76.19	3.36	11.74
64	76.82	2.41	17.13	.88	2.76	10.39	73.90	3.79	11.92
65	77.67	2.32	16.08	1.02	2.91	10.39	72.01	4.57	13.03
66	73.39	2.34	20.74	.85	2.68	8.79	77.95	3.19	10.07
67	79.76	1.65	14.98	.85	2.76	8.15	74.01	4.19	13.65
68	78.24	1.48	16.45	.83	3.00	6.80	75.60	3.81	13.79
69	74.65	1.72	20.14	.76	2.73	6.78	79.45	3.00	10.77
70	76.67	1.84	17.76	.88	2.85	7.89	76.12	3.77	12.22
71	77.36	1.97	17.31	.90	2.46	8.70	76.46	3.97	10.87
72	79.52	1.79	14.65	.97	3.07	8.75	71.53	4.73	14.99
73	77.95	1.64	16.83	.86	2.73	7.44	76.28	3.95	12.38
74	78.76	1.60	16.34	.82	2.48	7.54	76.93	3.86	11.67
75	81.70	2.26	12.78	.87	2.39	12.35	69.84	4.75	13.06
76	79.54	1.96	15.29	.76	2.45	9.58	74.73	3.71	11.97
77	79.35	2.10	15.39	.85	2.31	10.17	74.52	4.11	11.20
78	80.83	1.80	13.26	.98	3.13	9.39	69.17	5.11	16.33
79	81.26	1.63	13.58	.98	2.55	8.70	72.46	5.23	13.61
80	79.30	2.24	14.18	1.07	3.21	10.82	68.50	5.17	15.51
81	78.60	2.12	15.19	.98	3.11	9.90	70.98	4.58	14.54
Mini- mum.	73.39	1.48	12.78	.73	2.10	6.78	68.50	2.80	8.38
Maxi- mum.	81.70	2.93	20.74	1.07	3.41	12.35	79.45	5.23	16.38
Aver- age.	77.39	2.06	16.66	.88	2.87	9.24	74.34	3.97	12.45

There is a comparatively wide variation in the percentage of water in the various samples of potatoes, but, as we have no record of the manner in which the potatoes were kept before reaching us, we cannot lay much stress on this point. The average percentage of moisture in the Maritime grown potatoes is 2 points lower than the Ontario grown. This may be natural to the potatoes, or may be due somewhat to loss of moisture during transportation to Guelph.

Turning to the composition of the water-free material, we notice that the percentage amount of proteids varies from 6.82 to 14.43 in the Ontario potatoes and from 6.78 to 12.35 in the Maritime Province potatoes. One such test as here reported is not sufficient to prove that these results are characteristic of the varieties; but it does show that there is a very wide variation in the amount of this valuable constituent in potatoes. It is true we have no record that the potatoes were all properly matured when harvested, but the variation is nowhere more evident than among the first thirteen samples, which were obtained from the Experimental Department, where data was carefully collected with reference to maturity. The starch in these same varieties is fairly uniform, but, with one exception, they are from 3 to 20 per cent. below the average of the Ontario grown potatoes. A study of the data presented in the two tables seems to indicate that mealiness in the potato is not associated with high proteid, in fact, it would appear as though low proteid and high starch content are the desired factors in quality, especially in mealiness, of the potato. With reference to these points, it is worthy of notice that the average proteid content of the Ontario potatoes analyzed is 2 per cent. higher and the starch 4 per cent. lower than in those received from the Maritime Provinces. Also that the average total figures given for quality are 7.1 lower for the former than for the latter. The greater part of this difference is made up in the column showing the mealiness of the potato. If we compare the marks given for mealiness of potatoes containing 10 per cent. or lower of proteids, we find that, with very few exceptions, they stand at over 30, with several above 37; whereas comparatively few of those containing higher quantities of proteids received as many as 30 marks.

One season's work is not sufficient to draw any definite conclusions, but the work above reported indicates wide differences in the composition of the various varieties of potatoes, which may be influenced by soil, freedom or prevalence of blight, potato beetles, etc., or may be due to variety. A further study of composition and quality of potatoes where all conditions of soil and growth are known would be of interest and profit to potato growers and to the potato consumer.

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## SEED CORN.

By T. H. MASON, STRAFFORDVILLE.

The corn crop is one of growing importance in Ontario. It has been amply demonstrated that the corn plant succeeds well in nearly all districts of the Province, that it can be easily and cheaply handled where proper methods are followed, that it is a valuable crop for cleaning the land and when preserved in the silo gives a very large amount of succulent and digestible food.



On the other hand, outside of a comparatively small area, the importance of the crop for the production of grain is not generally recognized and yet if suitable varieties are selected and proper cultivation given, Ontario compares very favourably for grain production with the very best corn growing states of the Union to the south of us.

**VARIETIES SUITED TO LOCAL CONDITIONS OF SOIL, IMPORTANT.** We have such a very large number of varieties that one is quite perplexed in making a selection. While attention should be given to the experiments carried on at Guelph and Ottawa, even then it will be necessary to do a little experimental work on each particular farm to determine which is the best variety for that particular farm.

Corn is a gross feeder and requires an abundance of plant food to give best results and one of the most common mistakes is in seeding too thickly. Three stalks to the hill with hills from  $3\frac{1}{2}$  to 4 feet apart each way, according to the variety, will give best results in grain; where more seed is used there will be a larger amount of fodder, but it will be at the expense of the grain.

**SOME VARIETIES SUITED TO ONTARIO.** For Northern localities: Blue Blade, Early White Flint, Eight Rowed Yellow Canada. For Central localities: Longfellow, Compton's Early, Sweet Rose, King Philip, North Star Dent. For Southern Ontario: Wisconsin, White Dent, Salzer's North Dakota, Thoroughbred White Dent, Flint, Leaming.

Having decided upon the variety that suits our particular soil and locality best, then especial attention should be paid to the selection and care of the seed. There is no reason that Ontario farmers should import their seed as they do year after year, and so often with undesirable results. Corn responds to selection perhaps more quickly than any of our ordinary farm crops.

By going through the fields about ripening time making a little study not only of the character of the ear but also of the stalk, a selection could be made that would form the basis of future improvement. The stalk should be leafy, of moderate growth, should stand up well and carry, in the dents, one large ear. In the flints, it would be desirable to try for two ears, but not more. The ears should be of good length for the variety, packed full with straight even rows of corn, filled to the tips of the cobs and with the butt ends fully and evenly filled.

In this climate it is desirable to select from the earliest ripening ears. This seed should be husked leaving enough husks to braid up with, then hung up at once. The old fashioned summer kitchen is an ideal place to hang the seed corn, insuring its perfect drying before freezing weather begins. The seed keeps best when left on the cob all winter.

From this selected seed corn, another selection should be made, taking only the most perfect ears and planting them in a special plot for seed producing purposes. Very interesting and profitable studies may be made by selecting a stated number of ears, planting the most perfect seed of one ear in one row, and so on till the plot is completed. Then just after tasseling and before the pollen has begun to fall, go through and remove the tassels of every other row, thus giving cross-fertilization of one half of the rows by preventing self pollination. The results obtained in this way have in many instances been really wonderful.

During the past few years at some of the experimental stations in the United States, an immense amount of work has been carried on with the corn plant and with the most gratifying results. Our experiment stations

in this country are also taking up this matter and the Canadian Seed Growers' Association has done a great deal to encourage the improvement of this plant among its members. With the interest created and with our trained investigators at work, I am hopeful that the time will come in the very near future when we will have varieties adapted to every variation of soil and climate in the Province and giving us results vastly greater than those that we now obtain.

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## FARM CONVENIENCES.

BY HENRY GLENDENNING, MANILLA.

In attempting to write an article upon this subject we are perplexed not by the lack of material but by the multiplicity of things that present themselves for treatment. So many things are necessary, and are found on nearly every farm in the Province, that it would be useless to particularize them, such as the ordinary implements of tillage and harvesting machinery, therefore, I will deal with some conveniences that are common enough in many sections but are not to be found on every farm.

**LAY OUT OF FARM.** The farm should be laid out in fields of good size and of such shape that they can be easily worked. The average Ontario farm has too many fields upon it. They should be oblong rather than square; they should be approached by lanes that lead from the barns and should each be furnished with a gate of sufficient size to allow any farm implement to pass through them with ease. I am aware that we cannot always have the lanes where we would like, or the fields of the most desirable shape owing to streams, ravines, rock or pieces of swamp that have to be taken into consideration.

**LOCATION OF BUILDINGS.** No hard and fast rule can be laid down as to location, there being so many things to be considered. If the farm consists of say one hundred acres, with a frontage on the road that makes it nearly square, and if a suitable building site can be secured the buildings should be half way on the farm along the public road. The dwelling should not be far from the highway. The outbuildings, again, should be beyond the house, with a lane from the public road passing the buildings to the back fields of the farm. But many things in addition to those already mentioned prevent this. It has been so common in this country for the settlers to erect their small home on the first piece of land cleared, often with no regard to convenience to the uncleared portion which was by much the larger part. Near this small house there were small outbuildings put up and an orchard planted. As prosperity came, larger and more substantial barns were built, followed by a fine brick or stone house on a fine dry piece of ground. The farmer knows these are not where they should be, but they cannot be moved in the ordinary course of events. This all came from the pioneer who cut the first trees, but he has long rested from his labors and we will place no blame on him.

**BUILDINGS.** We will not attempt to speak upon farm buildings in general in an article of this kind, as it would make it altogether too lengthy, but will mention two useful buildings. First, there should be a shop or place for making repairs to machinery or other things required about the farm. It should be furnished with the ordinary wood working tools, a good strong vice and such iron working tools as will enable the farmer to make many repairs that are almost daily required on the farm. He should have on hand



a full assortment of bolts, rivets, screws, washers, etc., also some good hard-wood lumber consisting of oak, ash or rock elm of different thickness. I do not propose that the farmer should become his own blacksmith or wagon maker, but if he has these requisites on hand the repairs can often be made in less time than he could go to the village shop.

Second, there should be a building in which a stock scale is placed. The man who is buying, feeding and selling stock, and has no way of telling the weight of animals but by guess, is at a serious disadvantage when dealing with the expert drover, and he often makes a mistake in fattening animals that fail to put on the weight that he is led to expect from the amount of food consumed. By weighing his animals at regular periods of say one month apart, he knows which animal is making a profit and which is losing money. The wise man will soon weed out the unprofitable animals.

**WATER.** A good supply of pure water is one of the essentials of successful farming, in these days of feeding nearly all that grows upon the farm. On account of the high price of labor, the farmer cannot afford to pump the water by hand for a large herd, nor should dairy cows be turned out in the cold days of winter to drink at a trough once or twice a day. Even if it is just outside of the stable, there is loss of time tying and untying them and considerable loss in the milk flow from drinking a large draught of cold water which is apt to chill them and which retards milk secretion.

By using some kind of power to pump the water into a tank and have it fed into a drinking trough before the cattle, with a self-regulating valve, it does away with a great deal of extra work and the animals will be able to drink as often as they please. In this way there is no danger of their ever taking so much as to cause them to chill. This same tank can be utilized for house purposes and save a great deal of labor in the kitchen. By having the pipes attached to the kitchen range it will feed automatically and a full supply of hot water is always ready. This same tank will supply the bath room with both hot and cold water.

**POWER.** Nearly every farmer requires some sort of power on the farm, for pumping, grinding, pulping roots, running the cream separator, sawing wood, etc. We have six powers that are more or less used in this Province: water, steam, electricity, wind, gasoline and animal. We will give some consideration to each of them.

*Water power* is one of the best, being steady and reliable, where you have the supply and head. It is also, as a rule, cheap, but the number of farmers who can make use of it direct, are few.

*Steam* is a very reliable power. It is simple and sure to go when set in motion, but it is too expensive for the small or average farmer. There is also an element of danger from fire, besides the danger from frost twisting the pipes in the winter.

*Electricity.* This appears to be the coming power, where it can be procured at a reasonable rate, as it is always ready when required. It can be used for lighting, heating, and running all kinds of machinery at the shortest notice. The farmers of this Province do not appear to be alive to the possibilities of electric power on the farm. The companies that have been organized for electric development look to the cities, towns, and villages for their customers, and overlook the farmer, although their wires pass his door. If those power companies would bring the matter properly before the farmers, a large amount of power would be taken at profitable rates. It is time the farmers are waking up to the fact that many motor powers are being developed and are becoming a monopoly of the towns and villages. The farmer will be calling for a share of this power when it is too late.

*Wind.* This is the cheapest of all the powers and gives excellent satisfaction for many farm purposes such as pumping water, pulping roots, grinding grain, sawing wood. For grinding, the farmer has to watch and take advantage of the strong winds. Its weak point is that it does not run when there is no wind, and it is too irregular for running a cream separator.

*Gasoline.* This power has many things to recommend it. It is compact, strong and usually goes when you want it.\* Sometimes it refuses to run when you require it the most. There is also the element of danger of fire or explosion as is evidenced by the higher rates asked by the Insurance Companies where it is used.

*Animal Power.* There are still a few old sweep horse powers in use, but they are so clumsy and take up so much room that they are scarcely worth consideration by any person who has any thought of a modern power. The tread power is a good power; does not take up much room and on that account can be easily placed in a building. You can always be sure of it running when you apply the motive power. It is as steady as either steam or water, and its speed is readily controlled by the governors. It will give more power for the number of horses applied than the sweep power and there is no danger of fire. Its weak points on a farm are that you require horses or other animals to drive it. This is sometimes inconvenient in the summer time when the horses are needed on the land. We frequently hear it stated that this power is hard on horses. There are two causes for this. First, excitement of the horses when they find the platform giving away under their feet, and they make no forward progress in their walking. Second, the platform is set too steep which compels the animals to walk up a steep incline, often making two horses do the work that should be performed by three. A one horse tread power is one of the best investments on the farm where domestic help is scarce. By having a power located somewhere near the dwelling, it can be used for running the cream separator, churn, washing machine, circular saw, etc.

Our farmers should study to add all such conveniences as will lighten their work or increase the efficiency of their labour.

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## MY METHODS OF UNDERDRAINING.

BY A. H. FOSTER, TWIN ELM.

I first take my course in the spring of the year when the water is running on the top of the ground, and I find that to be the best way to lay out your drains, in order to follow the natural courses, and to make a success of it you must do that. I found that by digging a drain 2 to 2½ feet deep that I could dry out that particular place with a tile from 2½ to 3 inches, according to the quantity of water running there, until I come to where there are other courses joining into that one, I then continue it with a tile a little larger from 4 to 6 inches in that main one, until I come to my outlet, using the 2½ or 3 inch in the branches. I give herewith a plan of my drains, with the sizes of tiles I have used.

In digging my drains I run off the top score with an ordinary plough, then I had a ditching machine I used with two teams of horses. I dig 2 feet deep with it, after that I level with a spade, then I make a track with

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\*However, the price of gasoline is high, its offensive smell injures the cream, and it is not steady enough to run a cream separator.





them had no fall to carry off the soakage water. I have filled them all in. In some place I had to cross the open drains in order to follow the natural course with the underdrains.

I am sure that every tile I have underground has paid for itself over and over again. When I look back and think of plowing fields at each side of where a drain was required or else tramping through water to plough the whole field, and think of how I can go on those same fields now since they are underdrained as early as I like in the spring, and work from one end of the field to the other, it makes me wonder why people do not get to work and underdrain their farms. A few of the benefits from underdraining are, your land dries out quicker in the spring; you get your crop in earlier; you have a great deal better yield; and a very superior quality of grain. If you look at the field plan, in the upper left hand corner you will see quite a net work of underdrains. When I commenced to drain that field, my neighbor across the fence asked me what I was trying to do, I said I am going to try to drain this field so I can raise a crop on it. He laughed at me and said that it could not be done, that the man who owned the farm before I got it tried that and failed. However, I went ahead, and it is now a beautiful field, and grows the full of the earth all over it every year. So I believe that any farm can be underdrained if there is an outlet at all.

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## THE BEAN INDUSTRY OF ONTARIO.

By G. G. WHITE, B.S.A., ONTARIO AGRICULTURAL COLLEGE, GUELPH

Bean growing during the past half century has increased from a very small beginning to one of the most important industries in Kent and part of Elgin counties. One of the leading farmers of Kent recently made the statement that the bean crop of that county was of more value than the wheat, oats and barley crops all put together. Upon it they have for years past depended for the main source of their revenue, and to the bean crop may be attributed the making of South Kent one of the most wealthy, as well as one of the most progressive sections of the Province. While beans are grown almost all over Ontario, yet the counties of Kent, Elgin, Middlesex, Lambton, and Essex grow practically all that are shipped in or out of the Province. The true bean section comprises but a small part of these counties; yet, notwithstanding the limited extent of the territory, for many years over one million dollars worth of beans have been exported to the cities, mines and lumber camps of Canada, as well as to foreign countries. In the fiscal year, 1905, over 237,000 bushels of beans, having a value of nearly \$305,000 were shipped to foreign countries, the trade reaching France, Great Britain, British and French West Indies, Cuba, and many other parts of the world. During the fiscal year 1906, owing to a much smaller crop, our exports were lighter, amounting to 88,663 bushels, with a value of \$139,908.

The first beans were introduced into the district in March, 1856, by Mr. Seger Handy, of Morpeth, Howard Township, Kent. Mr. Handy was born on a New York farm and moved to Ontario during the first settlement of this district. Being familiar with bean growing in his native State, he soon introduced some seed into Ontario. In the Spring of 1856, he brought in two bushels of beans, which had cost him in the States \$3 a bushel. Some



claim that there were beans in the country before this time, but even if there were, it was not until Handy introduced them from New York, that the industry began to grow commercially. Early in the past century a French settlement was established around Painscourt in North Kent. These people are also said to have grown beans at an early date, but all they grew were for their own use, and no beans were shipped until after the industry developed in the South. Still there is no doubt that after a market was opened up bean growing spread out from this French settlement along the Thames River, and hastened the establishment of the industry in the North. The first beans Mr. Handy brought in were sown along the town line between Howard and Harwick about two miles from Lake Erie. These he shipped by boat to the States, there being no market in Canada at that time. Even the American market was not extensive, and beans seldom sold for over one dollar a bushel, which left them an unprofitable crop at that time, owing to the labor they involved. Largely for this reason the farmers were somewhat slow to commence growing them. The American civil war about this time caused a large demand for beans, and really gave the first stimulus to the industry. However, for some years, the great drawback was the need of a suitable market. The first Canadian market opened up was among the French in Montreal. A buyer was soon located in Chatham, and that point was for many years, the centre of the bean trade. At first the beans required a great amount of labor. They were planted, cultivated, and pulled by hand, and were thrashed either with a flail or by tramping the grain out with horses. The ordinary grain separator was used until about 1894, when a regular bean mill was introduced. Bean growing first spread from the starting place, north and east and west alongside the ridge. This high, dry land was more cleaned at that time; the land near the lake which has since become the best part of the bean district, was not cleared up for some years later.

The bean growing section of Ontario is confined to that part south and west of a line north from Port Burwell to about Ingersoll, and west to near Sarnia. However, there is only a small portion of this district where beans are grown to any extent. The average bean crop in this whole territory comprises about 45,000 acres, and produces on an average about 750,000 bushels each year. Of this 45,000 acres, nearly 40,000 are in the townships of Harwich, Howard and Oxford, in Kent and in Alborough, West Elgin, the remaining 5,000 acres being scattered here and there throughout the rest of the district.

It will be seen on the map, that the whole district is divided into four parts, according to the extent to which beans are grown. Sections 1 and 2, are where the greater part of the beans are raised, and where they are grown with the most success. The first district around Rondeau is the finest section for bean growing in the whole Province. It is almost certain of a good crop every year, whether the season be wet or dry. The soil is a rich, black loam, resting upon a fairly open clay subsoil. It has evidently been an alluvial deposit, and it contains a large amount of fertility. The contour of the land is slightly rolling, thus affording excellent natural drainage. This, however, is in all parts supplemented with tile drains in the hollows and natural water courses, and in some parts a full system of tile drains is laid. While it is thus protected against a wet season, it is also protected against a dry one. Being on a small cape, as will be seen by the map, and being almost in line with the lake shore on either side, it is subject to very heavy dews, which are deposited from the moisture laden air coming from the lake on three sides. The Rondeau, a shallow, land-





locked body of water, becomes heated to a high temperature, and there is no doubt very great evaporation must take place from it. This warm moisture laden air coming north at night over the cooler land deposits a large amount of moisture. The soil is also in a fine powdery condition, and retains a large amount of moisture. These are the reasons which are given to explain why the crop in this section is so seldom injured by drouth. When the crop farther north on all kinds of soil will be dying, that along the lake will be quite green. The close proximity to the water, and particularly to the hot water in Rondeau also moderates the climate, and prevents extremes, so it seldom, if ever, happens that the crop in this district is injured with frost either in spring or fall.

There is really no district line of demarcation between this district and that surrounding it. The loam soil gradually changes to clay, and as the soil becomes heavier the bean acreage falls of considerably. Along the north side of the district No. 2 is the "back" ridge. This ridge is about a mile wide at the east end, and varies as you go west, becoming much narrower as it approaches the lake. The soil on this ridge varies from a sharp gravel to a sandy loam. It rests on a gravel subsoil, and has excellent natural drainage. There is another ridge from a mile to a mile and a quarter farther south, running parallel with the north ridge. The front ridge, as it is called, is quite traceable through Oxford and Howard, and it joins the back ridge about Blenheim. Between these two ridges the land is very variable; some parts are heavy while others are quicksand; but the greater part of this land is a good sandy loam, and well suited to beans. It will be seen on the map that the third district runs into the second district almost to Blenheim. Just south of the front ridge there is a narrow strip of white clay, and this changes to heavy, black clay, as one goes farther south. This heavy clay is not well adapted to beans and few are grown.

The third district on the map has beans growing almost all over it, but in most parts they have not become a general crop on every farm. One year a farmer may have a considerable acreage, and the next year have none. In the two districts first mentioned, beans have come to fill a regular place in the rotation, but in this part the acreage sown each year varies a great deal. This district contains almost every kind of soil, much of it being well adapted to beans and other parts not so well suited. Beans are grown quite extensively along the Thames River. The soil is a rich dark clay loam. This land, if properly drained and cultivated, will grow good beans, and some farmers are having good success with it. Many farmers in this district, however, are going out of beans, claiming they are too hard on the land. The bean plant belongs to the Leguminosae, an order of plants drawing all their nitrogen from the air, and it should not be a hard plant on the soil. It is true that the plant draws fairly heavily on potash and phosphoric acid, but when the light soil on the ridge has grown beans for many years without any appreciable decrease in yield, it seems rather absurd that strong clay land should become exhausted so soon. The conclusion that beans are hard on the land is largely based on the fact that wheat is not so good sown after beans as after other crops. I found this difficulty with the wheat after beans wherever the soil was heavy, while on the loam and sand, the bean land is considered the ideal land for wheat. The only explanation I could find for this was in the physical condition in which the soil was left after the beans were harvested. Clay loam, or clay, with constant cultivation during the summer, becomes very fine and powdery. The wheat is always sown after beans without plowing the land.

The fine powdery soil on exposure to the winter rains runs together and bakes very hard. Thus the wheat is either winter killed or makes a poor, slow growth in the spring. Besides the land becomes very flat, and not being well drained, water is apt to lie on the crop. The soil also becomes packed very hard with the cultivation, and this interferes with free drainage. Much of the land about Chatham is not giving the success with beans it did a few years ago. The reason for this seems to be in the condition of the soil. They have cropped the land year after year, without turning under any clover or manure until it has become depleted of humus. Consequently, the soil has become so hard in many parts it is very difficult to get a good crop of beans, or to get a catch of clover by which to bring the soil back into a fertile condition. The crop is very much at the mercy of the weather, and unless the season is very favorable, a poor crop will be the result. The past few years have been too wet, and many of the beans on the clay spoiled, so that a low priced sample was the result. The beans also took a second growth when they should have been ripening, and this green growth prevented the crop from being cured as it should have been. Much trouble has been caused through the beans not ripening up early enough in the fall. Some account for this by the fact that immature seed has been used. Since bean pullers have come into use, the beans have been pulled a little green and they claim that the beans are getting later each year. Whether this be true or not is difficult to say, but, as with all other grains, mature seed should always be used. It may be that this district is a little far north, but as beans are grown many miles north of Chatham with very good success, this would not explain the trouble. Farther south on the ridge, and at Rondeau they have no trouble in getting the beans to mature early.

Because of these difficulties with the crop, quite a number of the farmers are going more into sugar-beet growing, and stock raising; and the acreage of beans is decreasing. Many, however, are continuing the crop, and by proper cultivation and drainage are making a success on the heavy land. Almost all the failures have been directly or indirectly brought about by poor drainage, improper cultivation, and lack of clover in the rotation.

In the eastern part of this district through Alborough, Dunwich, Southwold, and Yarmouth townships the bean acreage is increasing very rapidly. They seem to have better success here than they do in the north along the river. The soil is variable but the greater part of it is well adapted to bean growing. Ten or fifteen years ago, no beans of any account were grown in this district, but they have increased greatly of late, until last year, in the township of Alborough alone nearly 125,000 bushels were raised. Each year the acreage is increasing and the report of farmers seems to indicate that it will increase still farther. All along the lake shore they have given very good results. This country is for the most part rolling, and affords good, natural drainage which largely accounts for the success of the crop. I find in the newer parts the farmers in handling the bean crop, are not employing horse labor as much as they should. They are doubtful about using the harrow and side delivery rake, but they must come to this method as they have had to come to it in other parts.

The fourth district grows very few beans. In this part the principal bean sections are along the banks of the Sydenham River, around Alviston and in the south-western part of Middlesex county. Beans are not a regular crop in very many parts of this district; being a late crop they are generally sown where corn or some other crop has failed. The great draw-



back in the newer bean districts where only a few acres are grown is the lack of a good market close at hand, and of the proper machinery for handling the crop. The amount grown in many districts is not great enough to bring in a bean mill, and much loss is caused by using the regular grain separator. I have not been over much of this territory, but from reports which I have received of it, I find beans to be grown here and there throughout the greater part of it. South West Kent is a heavy clay soil, and has very few beans. Essex county has tried beans several times but they have not been a success. The soil in most parts of Essex is too heavy and is poorly drained. Tobacco is displacing beans in Essex and West Kent.

### CULTURE.

The culture of the bean plant varies a great deal with soil, climate, and location. What will give best results in one part, will not give success in another and in discussing the subject it will be necessary often to refer to various parts of the bean district.

THE SOIL upon which beans are grown varies a great deal. They are grown on everything from a heavy clay to a light sand. However, the appearance of the crop readily shows that all these soils are not equally suited. The best success has been got from a loam soil, well drained. After a loam, anything from a strong sand to a clay loam has given very good results when properly handled. A soil that has given remarkable results is a gravelly loam, or in some parts, it might be called gravelly clay. The soil contains a large percentage of sharp limestone gravel, mixed with another constituent much of the appearance of clay. The gravel keeps the soil open, while the clay accounts for its durability. This land has stood the cropping for many years and has shown very little decrease. On a dry season, however, the crop is more liable to suffer than on the loam.

On the other hand, there are some soils upon which it would never pay to grow beans. A black muck, such as the north-western part of East Dover townships, is very unsuitable. It tends to produce a great mat of vines, but very little grain. There are few pods formed, and these are seldom ever filled. Another soil giving equally poor results is a quick-sand, or any soil having a quick-sand subsoil coming anywhere near the surface. Such soils are hard to drain, and are consequently cold and damp. The beans are slow in starting in the spring; insects and diseases attack them, and failure of the crop is almost sure to result. Wherever I have found any trace of quick-sand, there I found the beans doing very poorly; or, as in many cases, they had abandoned them altogether. While such soil is not the best for any crop it is much less adapted to beans. Beans being a quick-growing crop with a short season, require a soil that will warm up quickly and rush the crop along from the start. White clay, I have also found to be one of the poorest soils for beans. It becomes baked very hard, and the plants growing upon it are small and sickly.

The ideal soil for beans must be perfectly drained. Nearly all the district where beans are grown successfully, whether it has good natural drainage or not, is thoroughly underdrained. In many parts that I have been over, particularly in the north part of Kent, on both sides of the Thames River, beans are not giving the results they should through lack of drainage. No crop is more particular in this respect than beans. Three or four hours with the water table at or near the surface of the ground at any time during the growing season, will destroy a whole crop. Then, too,

when the beans are planted, if they get a heavy rain it must be removed at once or the seed will be destroyed. At the time of harvest, if the ground be not well drained, and a heavy rain should come when the beans are pulled, they are sure to be spoiled and the sample very much deteriorated. In many parts of the country where beans were a failure, or an uncertain crop, I noticed the water table standing close to the surface; and even when underdraining was practised, unless it was very thorough, poor results were obtained. A large portion of the country could be made to grow beans quite successfully with more efficient drainage.

A perfect bean soil should also be porous, open and warm, so as to rush the crop along from the time it is planted, and of such a physical nature that it will not bake. Besides these qualities the soil which is able to hold the most capillary moisture and lessen the danger of drouth will always be surer to give success. The loam soil has a great advantage in this respect; the crop on the loam is often green and fresh when north on the ridge the beans growing on the sand and gravel will be wilted and drooping. In all cases, the clay and clay loam soils have stood the cropping well, but their great drawback is in their physical properties. The clay is usually rich in potash and phosphoric acid both of which are largely required by the bean. The sand on the other hand, while it may have the right physical properties and gives a quick growth in a few years of cropping with beans along with wheat, unless fertilizing is practiced, will become so exhausted as not to produce profitable crops. On such soils a good rotation should be followed where clover could be turned down every few years and the beans not planted two years in succession, as is sometimes done. In the district about Rondeau, where beans are grown most successfully, the rotation which has given best results extends over three years, being wheat, red clover and beans. This system of cropping has enabled them to keep their soil in good condition, and by turning down a clover sod every third year the land is always kept open and mellow and in ideal condition for beans. The importance of clover in a rotation has not been fully recognized in many parts, and those parts often where it is not needed. As stated before in some of the clay districts they have stopped the use of clover, until the land is now very difficult to get into proper condition for planting, and is almost certain to bake hard and dry out, so that the bean crop on such land is seldom a success.

**PREPARATION OF SOIL.** Having a suitable soil, well drained, the next important consideration is its preparation. Clover sod has given the best satisfaction in all parts. A few will advocate stubble land, but by far the greater weight of evidence is in favor of a clover sod, and my own observation of the crop growing has gone to confirm this opinion. As to the time of plowing, there is a greater variety of opinion, all of which seems to be correct for the district and conditions in which each particular method is followed. On the clay and clay loam, land which has a tendency to become sticky or hard, the fall plowing unquestionably has given the best results. To give the land the best treatment it should be plowed early and worked during the fall, but few of the farms follow this method. Most of the land is just turned over and left until spring.

On the sandy soil and all along the ridge early spring plowing is practiced. They all claim equally good or better results than from the fall plowing. Where there is any gravel in the soil, it is apt to wash with the winter and spring rains and become very hard if plowed in the fall. But if the land is not plowed in the fall, it should be plowed as early in the spring as it is possible. This conserves more moisture, and gives the land time to become packed down before seeding. By becoming solid below,



capillarity is increased, and more water will be brought to the surface to feed the plants during the dry weather. With late plowing the land is always loose and open, and is very liable to dry out. This is an important consideration, because of the bean having to make all its growth during the three driest months of the year. One field in which I happened to be in served as a very striking example to show the importance of early spring plowing instead of late. Part of the field had been plowed early, and a few ridges left until about a week before planting. A fine seed bed was prepared, and all the field planted the same day with the same seed. In the latter part of July when I inspected the field, it could be plainly seen where the line was, between the late and the early plowing. There appeared to be fully two weeks difference in age, and in fact those on the late plowing could never be more than half a crop. Several fields that were backward and gave signs of being a poor crop were planted on late spring plowing, and could be accounted for in no other way. When the land is loose and dry, there is not moisture enough to germinate the seed rapidly, insects attack the young plant, and whole fields are often destroyed in this way. The bean is a plant which must be rushed ahead from the time it is planted until it is ready for harvesting, therefore anything, such as late plowing, which tends to check this rapid development, greatly decreases the yield.

The only district where I found late spring plowing practised with success was in the first district surrounding the Rondeau. Here many of the farmers do not plow until the clover is a foot or more high. They usually aim to plow about a week before planting time. This gives the clover time to make a good growth, and thus a large amount of fertility is added to the soil. They also claim the clover by fermenting keeps the soil warm, and helps to rush the crop along. The objection to early plowing is that the land becomes packed too hard before sowing. They have had no trouble with the land drying out. This may be because of the heavy dews along the lake, and the peculiarly fine character of the soil, which allows the drawing up of a large amount of water from the subsoil. When plowing is left so late in the spring, however, there is not the chance to kill the weeds before planting time which is a very important consideration. Generally speaking, unless there is a certainty of an abundance of moisture, late plowing should not be practiced.

The aim of spring cultivation for beans should be first, to prepare a fine mellow seed bed, and at the same time to firm the soil so as aid capillarity and secondly, to destroy as many weeds as possible before the crop is sown. Much of the success or failure depends upon the preparation of a good seed bed. Many successful growers have said, "when the beans are above the ground in good condition they are half grown." A delay in germinating or any other check during the early stages of their growth will often be sufficient to cause a failure of the whole crop. Too much importance cannot be laid upon the thorough preparation of the soil. Where beans have been grown for years the farmers have learned this lesson by experience and they would not think of putting beans in soil that was not in first class condition. But in the newer parts of the district, and where beans are not a regular crop, there are many fields which are little more than half a crop through no other cause than lack of proper cultivation of the soil before planting. There is no time when more effective work can be done in cleaning the land of weeds, than before the crop is sown. Where the beans are grown most successfully and where they are kept cleanest they are seldom ever touched with a hoe; but the land is thoroughly worked before planting

and the greater part of the weeds killed in this way. By cultivating the land, then rolling, and leaving it for a few days, weed seeds germinate very quickly, and are then easily destroyed.

PLANTING, like plowing, varies as to time and method, according to the soil and location. Most of the beans are planted from the 24th of May to the 15th of June. Of late years many are tending towards earlier planting, and are claiming better results, but the success depends very largely upon the season. On the ridge and on the sandy soil, and out through Elgin county most of the beans are sown from May 24th to June 7th. Along the Lake shore few beans are sown before the 7th of June, the season being more backward. No conclusion as to the time of planting can be drawn, nor any hard or fast rule laid down. The grower must be guided entirely by his own judgment, and a few general principles. Never sow before the land is in shape, and the weather warm enough to germinate the beans in a few days, even if you have to wait until after the middle of June. I have seen good beans which were not sown until July. If you should sow too early and cold, wet weather keeps the seed from germinating quickly, it will generally pay to cultivate the ground and sow the second time. The seed has become so weakened as to give only a half crop at best, and a poor crop will take just as much work as a good one. If the weather is warm, and the soil in good condition, it is well to plant even as early as the 24th of May as the crop, if it is not set back, will be harvested during the hot dry weather of August, and thus lessen the danger of a spoiled sample, besides leaving the ground ready for wheat much earlier.

There are several methods of planting beans. At first all the beans were planted by hand, but now the bean planter and grain drill are used almost exclusively. The bean planter has given the better results on the lower clay lands. It drops the seed in hills from eight to ten inches apart, and three or four seeds to each hill. It makes a shallow groove into which the seed is dropped, and the earth pulled over in the shape of a small ridge. In this way the seed is practically on the surface of the ground. If a heavy rain should come the beans are not so apt to be destroyed as if they were planted deep with a drill. Besides if the soil is apt to bake after a rain, the beans will have less trouble in breaking through. The bean is a very tender plant in this respect. The least crust will often prevent them from coming through, and whole fields are often destroyed in this way. Another advantage of the planter is in leaving several beans in a place. Three or four beans will raise a piece of crust, where one would have no chance of breaking through. Beans planted with a planter, being on a small ridge are also easier harvested with the "pullers." The grain drill plants the seed much deeper and leaves a small groove over the row. If a dash of rain comes before they are up it is apt to lodge in the hollow and injure the seed or if the land be clay, form so hard a crust that it is impossible for the beans to break through. However, the drill has its advantages on sandy or gravelly soil. With the bean planter, putting the beans on the surface and covering them with the dry surface soil, often they have not sufficient moisture to start them. A few years ago the bean planter was used far more extensively than it is to-day. On the ridge in the loam district about Rondeau, and in fact everywhere except on the clay and clay loam, practically all the beans are planted with the ordinary grain drill, letting every fourth tube run. On the clay and clay loam, the planter has given the best general satisfaction, and it is still largely in use. A new machine which is giving splendid results is the disk drill. It puts the seed down to the moisture with-



out leaving any hollow for the water to lodge in, as is the case with the ordinary drill. Where tried it has given splendid results, both on light and heavy soils and promises to be more widely used.

In planting beans the object is to plant as shallow as possible, and yet cover the seed. This brings the seed up quickly, and gives the plant a good start. Beans cannot lie in the ground more than four or five days without being injured.

There is a great variety of opinion regarding the amount of seed to sow per acre. I find men sowing from one peck to a bushel and three quarters. The average seeding is about three pecks. If the soil is poor, a little more might be necessary, but for the average soil, three pecks is plenty and on rich land less might do. Where the farmers were sowing over a bushel, it was on new land; they claimed their land was strong enough to grow more beans to the acre. This, however, is a mistaken idea. The plants plainly showed they were crowding for space, and were producing straw instead of grain. Many sow a little over three pecks to allow for what may be dragged out with the harrows. This amount is of pea beans only; mediums would require a little more, and marrows almost twice that amount. With the difference of opinion as to the amount of seed to use and nothing to show what amount is the best, some valuable experimental work could be done on this question.

Beans are nearly all planted in rows 27 or 28 inches apart. After planting it is best to run over them with a light harrow especially if they have been planted with the grain drill. Unless the season is very dry it is not a common practice to use the roller after sowing.

**SUMMER CULTIVATION.** About three days after the beans have been planted, they should receive a stroke with the harrows or weeder, the harrow being preferred. This breaks the surface crust and leaves the ground loose for the plants to break through, as well as destroying any small weeds which may have started up. When the old bean is above the ground, before the young seedling gets a start, it is well not to harrow them. If the Cotyledons of the old bean be broken off at this time, the plant is apt to die. As soon as it has taken a firm hold on the ground the harrow may be used again, and this kept up at intervals of three or four days until the beans become too large. Always harrow across the row to avoid tearing out a large part of any row. It is well to harrow at least twice after the beans come up. This destroys many small weeds in the rows it would be difficult to get at later. When the plants become too large for the harrow the two horse cultivator is used. Use the shields on the cultivator at first to prevent covering the young plants, and always cultivate as close to the rows as possible. The second time the cultivator is run through, raise the shields a little and let the earth sift in among the plants in the row. This covers up and destroys all the small weeds that may be in the rows, and also forms a mulch among the plants. If the land has been properly prepared before seeding and the crop be harrowed a few times there will be little or no hand hoeing to be done. If the cultivator be properly adjusted and a little earth be allowed to fall each time among the plants it will do the work of several men. Each time the cultivator should be run shallower than before in order to prevent cutting off the small rootlets. At no time should the cultivation be deep. So long as a mulch is formed it is all that is required. It is best not to cultivate when the leaves are damp. The leaves are very tender, and any sand adhering to them is sure to destroy them. Most growers prefer to stop cultivating about the time the blossoms appear, though some will continue as long as they can drive through the rows. Unless is a very dry season, if

the beans are free from weeds, there is little gain from late cultivation. You are apt to destroy many blossoms and small pods, as well as the tiny rootlets which form in great abundance about this time.

The most important feature in bean growing, and the one needing most emphasis, is *clean cultivation*. Where beans are grown with any success they have come to see that beans and weeds will not grow together. No hoed crop requires to be kept as clean as the bean crop. If weeds are mixed with the beans the yield of beans is very much decreased; they are very difficult to pull by machine, and the rake will not work satisfactorily. Besides, when they are mixed with green weeds at harvest, it is almost impossible to dry them properly and the sample is very much deteriorated. The weeds in pulling bring up large chunks of earth which get on the beans and also help to darken and spoil them. Outside the two sections where beans are grown most extensively, are to be found the greatest number of weedy fields. It is not always where the most work is put on that the cleanest beans are, but where the work has been put on them at the proper time and where the land has been properly prepared. In speaking to scores of successful bean-growers, I have found all to be unanimous in this opinion that clean cultivation was the most important thing in successful bean growing and that on many farms the crop did not pay for that reason.

**HARVESTING.** Beans are usually ready for harvesting from eighty to a hundred days after planting. They are best pulled a little green. When green they do not shell so much, and they ripen after pulling, giving a more glossy and ivory appearance to the bean. The method of harvesting is almost the same over the whole district. They are pulled with a two-horse bean puller. This machine is an attachment which can be put on any ordinary two-horse cultivator. It has two large knives set in a V shape, which cut the plants off below the ground and draw two rows into one. The revolving, three-fork, side delivery rake is then used and eight rows of beans thrown into one windrow. The machine is used almost everywhere and will do the work of a dozen men. The beans should be turned after every shower, or every few days whether there is rain or not, until they are dry. If they are turned when a little damp, the rake may be used without danger of shelling, and it will turn satisfactorily twenty to twenty-five acres a day. The object in curing beans is to keep the bunches or windrows from settling on the ground. If the pods get down to the ground and the air has not free access to them, the beans are sure to be blackened and spoiled. Most of the beans are loaded with a fork, but a few growers are using the hay-loaders. As the beans must be very dry when handled, this method shells considerably, and is not generally used.

The thrashing is done with regular bean mills, which are made for the purpose. In some districts, where there are not enough grown to pay for a bean mill, they are using the ordinary grain separator. This machine, however, breaks a great many beans and is not satisfactory. The bean mills leave the beans ready for the market. Some are run through the fanning mill before selling but most of them are sold direct from the mill. The old practice of hand picking on the farms has gone out altogether.

#### INSECTS AND DISEASES.

Few farm crops are more free from insects and fungus attacks than the bean crop. While there are several insects which prey upon the plant, none have done serious damage in Ontario, and none have become so plentiful as to require more than careful prevention. The most destructive insect pest, the



bean weevil, has not as yet found its way into Ontario. This insect has been the means of stopping bean-growing in many parts of the United States, and if it ever becomes plentiful in Canada it may be the means of stopping bean-growing here. Farmers and dealers should be very careful when bringing seed from foreign countries to have it free from the weevil. This insect is found in the ripe-bean, much the same as the red weevil, and can readily be detected. Beans containing it should be well fumigated with carbon bisulphide, or else burnt. I have found in almost every case where insects or disease were doing much damage that there was something wrong in the handling of the crop. The soil was not fertile, was not properly cultivated or some other condition was not right. Where the crop was doing well and was properly handled there was little trouble with insects or other pests.

**CUT-WORMS.** The bean along with nearly every other crop, falls a prey to cut-worms. In some parts they have done considerable damage, but never so much damage on beans as on other crops. Often as many as three crops have been destroyed off a piece of land in one spring, and beans planted on the land would not be touched. Many farmers complain of a small worm about half an inch long, which eats off the plumicle just as the beans have pushed above the ground. These beans seldom mature when thus attacked. I have seen whole fields which have had to be replanted because of the attacks of this insect. From all reports which I have heard of this insect and its work, it appears to be one of the cut-worms. I was not in the district where they were at the time they were working and consequently, I was unable to secure a specimen. I have never heard of this insect doing damage where the seed comes up quickly. It is always where it lies in the ground for sometime that the plant is attacked. Therefore the best way to prevent it is to use fresh seed, have the ground in the best possible shape, and not to sow unless the weather is warm. There is no practical way of combatting the cut-worm on a large scale. Poisoning with bran and paris green is sometimes resorted to where they are very bad, but if preventive measures be observed such treatment will not be necessary.

**PALE STRIPED FLEA BEETLE** (*System blanda*.) This insect is about one-eighth of an inch long and about one third as broad. It has two yellow stripes down the back. It is a very active insect, and is difficult to catch or even to see. It closely resembles the ordinary turnip flea-beetle, but is much larger. It usually appears about the 25th of June, and continues to the middle of July, doing considerable damage during that time. The bean appears full of holes, much as if it had been shot through. The insect eats off the upper epidermis and often the lower epidermis is left a pale film, which soon falls away, leaving a round hole. I have found this insect also to be worse where the beans were not under the most favorable conditions. Often a knoll of hard clay or other poor soil in the middle of the field, would be almost destroyed while the plants around on good soil would not be touched. The plants seem to grow away from it very quickly, and about the 15th of July its attack is over. I have found it doing damage worth sneaking of only in a few places. Some claim this to be the first year it has been in the country. The larvae stage of this insect is passed on weeds, therefore, the destruction of all weeds is of first importance. Spraying can never become general on so large an acreage, but if it should be practiced kerosene emulsion should be used, as the bean is easily destroyed by arsenical poisons. Bordeaux mixture is said to be very distasteful to the pest, and will prevent its attacks.

**STALK OR ROOT BORER, (*Hydroecia*.)** This insect belongs to a large class which attacks a variety of plants. The larva of the insect is deposited in the centre of the stalk and eats the stalk off just above the ground. It may eat only a hole out, or it may gnaw the stalk half-way around until the plant falls over. The work is all done from the inside, and the damage is done before there is any outward indication of the presence of the insect. For this reason the insect is very seldom seen. When the plant falls over the insect is gone. It passes into the ground, and there changes into the adult form, which is a medium-sized greyish brown moth. The injuries from this insect have not been very great. It does not attack the plants until the pods are partly formed, and even those which are badly injured will generally continue to develop. The insect being in the stalk there is no remedy for it.

### FUNGUS DISEASES.

**ANTHRACNOSE.** This is perhaps the greatest enemy of the bean plant in Ontario. It appears on the leaves and stalks as reddish brown spots and continues to spread throughout the summer. When the pods are formed it attacks them in the same way. The round pits filled with pores on the pods are somewhat sunken, and often the pod is shrivelled and does not develop. The threads of the fungus goes through into the bean, and cause a black spot to appear? This fungus is commonly called rust by the farmers, but is altogether different. This disease is worse where the beans are planted two years in succession on the same land. It is also worse on poor soil. In the North of Oxford and Howard, there is a great deal of quick-sand, and on this soil I found the disease most prevalent. The fungus, not only injures the growing crop and lessens the yield, but in darkening the bean it lowers the price per bushel. For every pound of spotted or discoloured beans, five cents a bushel is deducted from the market price. Thus it will be plainly seen that the importance of doing anything which will keep this disease in check. The spotted beans all contain spores of the disease and help to carry the disease over to another field. All seed beans, whether spotted or not, should be sprayed with formalin or immersed in blue-stone just before planting. Beans should not be planted on the same ground two years in succession, as the diseased leaves falling contaminate the ground with spores. The only method of destroying the fungus on the plant is to spray with Bordeaux, which is scarcely practical on a large area. Care should be taken to clean up all of the crop and to destroy weeds and rubbish, because on such material, the spores pass the winter.

**RUST.** Although much talked about there is very little damage done by rust. Most of the so-called rust is anthracnose. However, there is a large portion of the crop which is more or less rusted some seasons, but nothing to cause serious damage.

**MILDEW.** Along the lake shore where there is a heavy dew and the plants are kept moist a large part of the time, there are years when mildew will do some damage. The past season only a few fields were effected, and these to a very slight extent. It does not occur until the plants are well grown and does little injury.

For all insects and fungus diseases, clean cultivation and a good rotation of crops where beans will not follow beans is the very best preventive. Besides this, all weeds and rubbish which would afford shelter during the winter should be destroyed.



## VARIETIES.

At one time practically all the beans grown in Ontario were "mediums" but now the Pea Bean has almost entirely displaced them. The great bulk of the beans grown to-day are pea beans. Of late years many new varieties have been introduced, each of which has its own particular market. I shall briefly describe each variety from the growers stand-point, and deal with their markets later.

**PEA BEANS.** Pea Beans were introduced into Ontario from New York twenty-five years ago by Mr. E. G. Handy, son of the man who brought in the first beans. Before this time, "Mediums" were almost exclusively grown. The two bushels of Pea Beans which were introduced, produced over ninety five bushels the first year. This established their reputation as a yielder, but the farmers did not take to growing them extensively, as the market for them was small, and the price lower than for the mediums. Soon, however, their market extended, and they became higher in price than the others. It was not long after that until their culture spread over the whole territory. They are a small white bean, somewhat round in shape. The plant is not large, and stands fairly erect, holding the pods well off the ground. They will break through a heavy crust without any injury, and will withstand considerable wet while growing. As soon as harvested, however, they must be very carefully handled, as they are very easily spoiled. Pea beans are suited to any kind of soil that is rich and fairly well drained, and they will stand heavier soil than many of the other varieties. Another great advantage of them, is their earliness; they must be harvested in plenty of time to allow of wheat being sown.

**MEDIUMS.** The medium bean is about one-half larger than the pea bean and much flatter, being more of a kidney shape. The whole plant is larger than that of a Pea Bean. It gives almost, if not equally as good a yield, and is in most respects quite as hardy. Its main fault is in being about two weeks later in maturing than the pea bean, which in many parts leaves it too late to sow wheat.

**MARROWFATS.** These are a large white bean, much the shape of a pea bean and about three times as large. They are more adapted to loam and sandy soil than to clay. In clay, being a large bean they are apt to become broken off in coming through the ground. They have given very good yields where tried, and there average is increasing very much of late years.

**YELLOW EYES.** This is another variety of the Marrowfat bean. It is the shape of the white Marrowfat, and resembles it in every particular except color; the eye of the bean having a yellow blotch around it. There are two kinds, a large variety about the size of an ordinary white Marrowfat, and a small variety nearer the size of a medium bean. The small variety has given the better results where tried. The yellow eye beans have given satisfactory yields on sandy loam, but on heavy soil, they have given very good results. They are only adapted to light, loose soil, and should not be sown where the soil is apt to bake. Like all large beans, they are difficult to thrash without breaking.

**RED KIDNEYS.** This is a large bean about three-quarters of an inch long and rather narrow. They are reddish brown in color, and somewhat kidney shaped. They weigh only 58 pounds to the bushel while other beans weigh about 64. These beans are somewhat flat and difficult to thrash. It is also hard to get them dried out and cured so they will keep without becoming musty. They will stand more rain than the pea-bean when pulled

without becoming discolored. They are very apt to revert to the original bean from which they were produced and give rise to a coarse, long vined bean of very inferior quality. Generally speaking, red kidneys have not given very good success.

**WHITE KIDNEYS.** These beans have just lately been introduced. They are very similiar to the red kidneys except in color. As far as they have been tried they have given better results than the red variety, and may prove a profitable bean to grow.

**BLACK TURTLE SOUP.** This is a small glossy black bean, much the shape and size of a pea bean. They are quite hardy and do well on moist soils. They do best on strong soil even if it is somewhat heavy. They are a very short-strawed variety and on poor land they are difficult to handle. The bean is very oily, and they will withstand a great amount of exposure without any danger of spoiling. They have given about the highest yields of any variety. They are, however, a very late variety and in many parts wheat could not be sown after they were harvested. They should not be grown extensively, as their market is very limited and liable to be over stocked, if any large quantity of the variety is grown. They cannot be grown satisfactorily on the same farm with the pea beans, because of the danger of mixing the black and white beans. Both being the same size it is impossible to separate them by screening.

**OTHER VARIETIES.** Some of the other varieties have been grown but have given little success. The Red and the Green Flagelles, a French variety, have been tried. They have a very long, coarse vine, and are difficult to handle. Some are growing wax beans on contract for certain dealers. These are shipped to the United States to be sold as seed for green beans. The wax beans are poor yielders, and have a hard thick pod, adhering closely to the bean, which makes them very difficult to thrash.

#### MARKETS AND MARKETING.

When the beans are brought into the elevator they are run through a grader, and all rough dirt removed. From the cleaned beans a small sample of ten or fifteen pounds is taken, and hand picked; all dirt and bad beans are removed. Nothing but clean, unspotted, whole beans are allowed to pass. The refuse picked out is weighed, and for every pound of such material five cents a bushel is deducted from the market price. If beans are \$1.40 a bushel and a sample picks four pounds to the bushel, the farmer will receive \$1.20 for his beans. The sample must be of uniform size, and a clean, bright, ivory color. Size is of little importance, so long as the grain is well filled. The small beans are often worth more than the large ones. In the elevators the beans are usually cleaned again by machinery, and all the dirt and bad beans possible removed. Most of the beans for the Quebec, Ontario, and Western trade are sold in this condition as "prime beans." They are supposed to pick less than two pounds. The European and Maritime trades demand all hand-picked beans. All hand picking is done by women. They are arranged at a long table, and the beans are passed before them on canvas, while they pick out the dirt and bad beans. They are usually paid about three cents a pound for the dirt they pick out. A machine has been introduced in some of the elevators for this purpose. The beans pass over rollers, which draw the rough dirt and spoiled beans through, while the smooth coat of the good beans allows them to pass over. The great trouble with it is that it draws through too many good beans. When the beans contain much clay they are usually put through a machine, which



crushes the lumps, while a set of brushes rubs off the loose dust and polishes the beans. Beans for the Maritime market are all shipped in five-bushel barrels, while those for other markets go in sacks.

The principal market, and the one which takes at least three-quarters of the entire crop, and sometimes all of it, is the home Canadian market. Some years ago all the beans were used in the lumber and mining camps. They could be taken where potatoes could not, and were used as a substitute. Since the lumber camp trade has decreased, a new market has opened up in the cities. The use of beans by all classes of people is increasing rapidly. Clark & Co., of Montreal are among our largest canners of baked beans. The Western market, while yet in its infancy, is growing rapidly. The Maritime Provinces take a large amount of beans from Ontario, Halifax, St. John, and Sydney being the principal markets. Montreal and Ottawa are the largest markets in Quebec and Ontario. From these points the beans are shipped out to the camps. The Pea Bean is the only bean which is in demand in Canada, with the exception of a few car loads of Yellow Eyes, which are used in the Maritime Provinces. The Pea Bean has gained a very strong hold upon the Canadian market, and they are the only bean that can be sold to any extent. A few years ago there was a small class of the people in the Eastern Provinces demanded Yellow Eye beans. Some farmers grew them, and, the supply being limited, they sold for a high price. The next year too large a quantity was grown, and the price fell as low or lower than the pea beans. Last year, while most of them sold at as high a figure as the pea beans, yet if a much larger quantity had been grown there would have been no market for them at any price, after the people in the east were supplied. About 40,000 bushels were grown here last year, and that amount is very close to the limit to which they can be safely grown and sell at a paying price.

Of the foreign markets the French market is the largest. In the fiscal year 1905 we shipped to France 85,000 bushels, and in 1906 we shipped 49,798 bushels, in both years almost three times the amount shipped to any other country. These were almost all pea beans. The British market is also a large market, taking over 37,000 bushels in 1905 and 18,241 in 1906. The British market does not take a high-priced bean. A large quantity of cheap European beans are shipped in at a price at which we could not afford to sell. They demand a large bean, and will not take the pea beans, claiming them to be screenings. The Medium and Narrows suit them best. The British market is a large bean market, and one we should do more to waken up. A large quantity of beans are shipped to the British and French West Indies and Cuba. These beans are nearly all shipped out in bond by the United States. The Red Kidneys and Black Turtle Soup are nearly all used by the Spanish in these southern countries. The Red Kidneys are nearly all used in the West Indies. The Black Turtle Soup are used largely in Cuba for making certain fancy foods, and the demand for them is very limited. While the price is at present quoted at \$3 a bushel, it would be impossible to sell a large quantity of them. About four or five thousand bushels is near the limit of their consumption each year; above that quantity they cannot be sold at any price. The Red Kidneys have a larger market, but they have been grown extensively in Michigan; their market is apt to be overstocked at any time. Pea beans are also in demand in Cuba and the West Indies. The Marrowfat is used extensively in all of these countries. At present this bean has a large market and it is not widely grown. It is a high-flavored bean, and is much preferred in parts of the United States, the West Indies, and Great Britain.

At one time the United States took all our export beans, but of late

years the price of American beans has fallen, and the duty has been raised to 45 cents a bushel, so that it has almost shut us out of that market. The Boston market will take nothing but Pea Beans. The smallest Pea Beans have been screened out and sold in Boston as Vermont Pea Beans at \$2.50 a bushel. Many of the Marrows and Kidneys go to New York.

The price of beans is very variable, but averages about \$1.10 to \$1.20 a bushel. Sometimes it has fallen as low as 30 cents and has gone up as high as \$2. This is, of course, for pea beans. The other varieties are somewhat higher priced, depending upon their supply and demand. The price of beans is very unsteady, and may vary 25 to 50 cents a bushel within a week, without any apparent cause. This makes farmers afraid to grow the crop, lest at any time the price should fall, as it did a few years ago. The cause for the low price then, however, was an over-production and a loss of the American market by their raising the duty just at that time. Before then we had depended altogether on the United States market to take our surplus, and had no other foreign market upon which to fall back, as we have now. Our present market in Europe and other parts of the world, as well as our growing home trade, such a fall in the price is not likely to occur again. The fluctuation in the prices is largely caused by local dealers. To get a large portion of the available beans each dealer quotes the price as high as possible. This, of course, forces the other dealers to raise their price, and it often happens that prices are raised so high they are unable to sell at a profit. The commission men refuse to buy, or prefer to bring in low-priced foreign beans. When the wholesale trade is thus closed the object of the dealer is to buy no more beans, and consequently the price is lowered 15 or 25 cents a bushel, so that farmers will refuse to sell. When the market is falling the farmers, not knowing where it will stop, rush their beans on the market, while the commission man, hoping to get his supply at the lowest price, refuses to buy. This causes a great deal of confusion and unnecessary loss to both farmers and dealers. Until a more steady price can be maintained and the beans are kept from being rushed on to an already overstocked market, this condition of affairs cannot be remedied. A few local buyers have the regulating of the prices wholly in their own hands. Much of the beans are bought from the farmers and sold to the commission men by auction. The dealer who will pay the highest price to the farmers, and who will fill the orders of the commission men at the lowest figure, will do the largest trade. There is no set price throughout the district, as with other grains, and this close competition for business makes the price very uncertain. Another cause for this condition of affairs is the lack of reliable information regarding both the home and foreign crops. Many farmers and dealers, thinking to benefit themselves, withhold information regarding the condition of the crop and the probable yield, or even circulate false reports. Thus it is impossible to find out the amount of beans available in the country and to set the price accordingly at a point where the business can be carried on at a profit to both farmers and dealers. As it is at the present time, both parties are working against each other in the dark, to the disadvantage of both. So much hard feeling has been aroused against the dealers that the farmers have organized a company of their own to carry on the business. If the farmers and dealers had worked together and had not been afraid to give reliable information on the crop, the business could have been carried on much more satisfactorily to both. There is, besides, no information of any kind furnished on the foreign crop. The United States crop is the only one from which we get reliable reports. Our prices here are greatly influenced by the crop in many of the European countries, and of these we have no information whatever.



There is a great variety of opinion held among dealers and farmers regarding the possibilities of extending the bean industry. At present the acreage is tending to increase slightly, and bean growing is extending over a larger territory each year. While it is increasing considerably in Elgin and Middlesex, the decrease in the west and north will be nearly enough to counteract it. There will be more danger of overstocking the market by an excessive yield than by an increased acreage. Some believe the extension of the acreage will be so great as to destroy the present industry, but as far as can be seen at present, there are no grounds for such opinion. If we have a small crop, such as in 1905, the home market will take all, and prices will remain quite high, but if the crop be so large that we are forced to look for a foreign market, then the price of beans must be brought down to the foreign market basis, which is usually somewhat lower than the Canadian price. However, prices on the foreign market seldom fall below a dollar a bushel, and it seems almost incredible that a slight increase in the small bean area of Ontario should have much influence on the world's market. The general opinion of farmers is that beans will be grown extensively at a dollar a bushel, but below that they are not a very paying crop. Some believe that if they drop below a dollar they will still be grown, but will be used for hog food, for which purpose they are very highly prized. This turn of affairs, however, is very undesirable, because of the detrimental effect beans have upon the quality of the bacon.

Anything which can be done to increase the Canadian market is of greatest importance. In Canada we are not brought into competition with other countries, and can always maintain a steady paying price. The influx of settlers into the west is increasing the market in that section. At present we are shipping about 50,000 bushels of beans to the west each year, and they are also getting from 10,000 to 20,000 bushels from the United States. The quality of beans used in the west is very poor, and they command a low price. Few beans are shipped from here to British Columbia. The short water route from California enables the Americans to land beans in Vancouver over a 15c duty much cheaper than we could ship them from here. Consequently, with our excessive freight rates, that market is placed beyond our reach. The California beans are of a very poor grade, and sell at a low price. Many are in favor of raising the duty, which at present is only 15c a bushel, as against 45c going into the United States. But even if it were raised to 45c, it would not place us on an equal footing with the American in British Columbia, as our freight rates to many parts of that province are as high as \$1 a hundredweight. This would only mean raising the price to the consumer in British Columbia without helping the producer in Ontario. However, the amount of beans imported from the United States has increased from 14,538 bushels in 1905 to 24,003 bushels in 1906, and if such increase continues a higher duty may become an absolute necessity to protect the Ontario grower. The quality of beans as a food is becoming more fully recognized, and the consumption in our cities and towns is rapidly increasing. With this increased demand in our cities and through the west our Canadian trade will increase in proportion. Nearly all of Elgin County, and, in fact, most of the district mapped out, is well adapted to beans, but the encouragement of bean growing over this area at present would not be advisable.

One of the greatest drawbacks to the industry is the excessive freight rates. At present there is a discrimination against beans which places them at about twice the rate of other grains. The rate on beans to Montreal is 19½c a hundredweight, while on wheat it is only 13½c for home consumption

and 9c for export. To St. John the rate is 25½c, to Calgary 79c, and to many parts of British Columbia \$1. When we have to compete against other countries these excessive rates place us at a great disadvantage. Besides, the western market is placed almost beyond our reach. There is no reason whatever why beans should be higher than other grains. It is claimed by the railway companies that because of the extra value of the beans over other grains the freight rate must be higher to meet the danger of loss by wrecking. Their tariff, however, is not in proportion to this extra value. Beans will not average over \$1 a bushel, while wheat will sell at about 80c. The freight rates are about as 19c to 10c. Beans are all shipped in barrels and sacks, while wheat is shipped in loose bulk, thus increasing the loss from a wreck less in case of the beans than with other grains. Even flour, which has a much higher value than beans, is shipped the same way, and goes out at a much lower rate. With the great number of empty cars going to the west there is no reason why a cheaper rate could not be given to western points. This is the greatest grievance in the bean business to-day, from both farmers and dealers. When the demand is not bright, and prices fall to near a dollar a bushel, the business is often at a standstill because of the high freight rates.

#### SUMMARY AND CONCLUSIONS.

After reviewing the whole situation, I find there are a few matters in connection with the agricultural side of the business requiring special mention. The necessity of thorough drainage, proper preparation of the soil, and clean cultivation during the summer cannot receive too much attention. I find also great room for improvement in the seed used. Little or no improvement has been done on pea beans since they were first introduced. As a result, they have become mixed with mediums and other varieties, and many of the samples grown are very uneven in size. The beans are not yielding so well as they did some years ago, and the quality of the seed used is partly the cause. Many farmers buy their seed from the elevators, and often take very inferior seed because it is cheap.

While pea beans are demanded by the Canadian market, yet there are many other varieties of small beans which would pass as pea beans, there being, as far as I can learn, no distinct variety difference between pea beans and some other small beans. I would strongly recommend the White Wonder, a small bean, which has given the highest results at the Experimental Farm. It is a small white bean, and resembles the ordinary pea bean in appearance of grain and character of growth, and is a very prolific yielder.

Many are opposed to growing anything but pea beans, but, if judgment be used, there is a place for several others of the so-called special varieties. If but one variety pea beans be grown we are in danger of overstocking that market to which they are sent. But if one-quarter of the acreage be devoted to other varieties, as Yellow Eyes or Marrowfats, etc., a new market is opened up, and these special varieties do not compete with the pea beans, but are put into markets where we could not put the latter. Thus the danger of overstocking the regular market is greatly lessened. However, there are certain of the special varieties which have very limited markets, and should be grown sparingly. The price quoted is no guide as to the demand, as one man may hold all the beans which are available of that particular variety, and he is thus able to hold the price at two or three dollars a bushel, while it would be absolutely impossible to sell a bushel of that variety. At the present time a variety which is quite safe to grow is the White Marrowfat.



It has a large market and is a satisfactory grower. The Red Kidney has also a large market, but the large production in Michigan makes it more uncertain. It is also not a satisfactory bean to grow in Ontario. The Yellow Eyes have a market up to about 40,000 bushels, but over that amount there is apt to be little or no demand. Black Turtle soup have a market for about 4,000 to 5,000 bushels, and farmers must be very careful in going into them strongly. For other varieties the grower must be well posted on the market and other conditions before attempting them. The fact that beans of any variety are a high price in the spring often causes more to be grown that season than there is a market for. To be successful with these varieties a careful study must be made of the varieties, and a variety sown only on soil to which it is adapted. It is always safer to plant the special varieties to the extent of about one-half the crop, and pea beans for the other half.

In some parts, where beans have been grown for years on light soil, the yields are getting smaller each year. If this special crop is to be continued, some form of fertilizer will have to be used. I should like to see some experimental work carried on to find the best fertilizer for such a purpose. Some farmers have been using ashes on bean land, and have received very favorable results.

In the commercial side of the industry what is most needed is lower freight rates, more reliable information regarding home and foreign crops, and a more complete hold upon the western market. Much could also be done toward opening up a better market in Great Britain, the West Indies, and Cuba. If these markets could be opened up there would be no danger from an over production. There is a large district on which beans could be grown successfully, but until a larger market opens up it would not be well to encourage it.

The experimental work which is now being carried on with beans is not doing the good it should. While the crop is well handled, and every care possible is taken of it, the climate is altogether too backward at Guelph for success with beans. I have made enquiries through the bean district of ex-students and friends of the institution as to the value they derived from the bean experiments at the Ontario Experimental Farm. They all claimed they were of no use to them, and many asked that experiments be carried on inside the bean district. The season at Guelph is too slow for beans, and they do not mature properly or give a good sample.

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## TOBACCO.

By. PROF. J. B. REYNOLDS, O.A.C., GUELPH.

The object of the investigation here reported upon was to discover, so far as mere inquiry can discover, the probability of success that would attend the growing of the finer grades of tobacco in Ontario. There are several varieties of tobacco, each variety producing, at its best, leaves for the manufacture of a certain grade of cigar, smoking, or chewing tobacco. Along with the variety must be considered two other controlling factors; climate and soil. Apparently there are required certain conditions of temperature and humidity for the proper growing, ripening, and curing of tobacco; also there seem to be required certain conditions of soil for the production of the finer grade of leaf for cigar manufacture.

The varieties of tobacco that are grown in latitudes and climate similar to that of Southern Ontario, are: first, the cigar types; second, the manufacturing types, as they are called, for smoking and chewing; third, the bright yellow types, for cigarettes, for smoking, and plug wrappers; fourth, the White Burley, principally for the manufacture of chewing tobacco.

The cigar types are at present grown principally in Connecticut, Pennsylvania, Ohio, and Wisconsin. In Connecticut the specialty is the wrapper leaf, that is, the outside leaf used in wrapping the cigar. Wisconsin is known as the "Binder" State; that is, it produces a special binder leaf, used as an inside cover next to the filler. Ohio produces a large proportion of filler tobacco. The manufacturing types are produced in a number of the states of middle latitude, from Virginia westward to Arkansas. The bright yellow type is generally confined to Virginia and North Carolina. The White Burley is produced in Ohio, but in very large quantities in Kentucky. This latter is the principal variety grown in Southern Ontario.



FIG 1. Tobacco Field and Curing Sheds on the Farm of Walker Bros., Walkerville Junction.

Tobacco growing in Ontario is almost altogether limited to the southwestern counties of the Province, Kent and Essex. From the town of Blenheim westward through Leamington, and along the water front to Windsor, following the narrow belt within the immediate climatic influence of the water, is the tobacco district of Ontario. Isolated areas here and there are of relatively insignificant consequence as compared with this main belt. Here, as was said above, the principal variety grown is the White Burley, and it is used almost altogether for the manufacture of chewing tobacco. Some years ago the Empire Tobacco Co., by extensive advertising, and by promises of a ready, profitable sale, induced the farmers in this southwestern district to commence the growing of tobacco of the White Burley type. It is estimated that this year there are at least 10,000 acres of tobacco within the limits above mentioned.



Besides the White Burley, the other varieties have been experimented upon. The Erie Tobacco Co. of Windsor, have this year commenced an experiment in the growing of the bright tobacco of Virginia for the manufacture of smoking tobacco. The Walker Co., of Walkerville, have a very large plantation, principally of the seed leaf, for the manufacture of chewing and smoking tobacco. Besides these, there are a number of varieties grown here and there, but all are of little consequence in area. This inquiry has been directed toward the influence of climate and soil upon the types and qualities of tobacco that may be grown.

It should be stated in this connection that, after all possible comparisons have been made in respect to climatic and soil influences, the only final test is that of experience. The susceptibility of the tobacco plant to physical conditions seems to evade analysis. There are differences in results where no differences can be detected in any climatic or soil condition by meteorological instruments or apparatus for analysis. The most that can be done, therefore, in this connection is to note the probability of success by comparing physical conditions.

#### THE INFLUENCE OF CLIMATE ON TOBACCO.

Of the various climatic factors that influence the growing of tobacco, the following seem to be the most important:

1. *The Rainfall during the Growing Season.* Tobacco is a plant that requires large quantities of moisture for its fullest development. It is a large, rapidly growing and succulent plant, and during its period of growth it draws heavily upon the moisture content of the soil. It is susceptible to extreme drought. When the moisture in the soil has become depleted excessively, the plant ceases growing, commences to ripen, and fails to attain the quality of leaf which it would have done under favorable conditions of moisture. On the other hand, it is equally susceptible to excessive soil moisture. Low wet places in a tobacco field can be immediately detected by the yellowing of the leaves. In this respect it is quite as susceptible as the corn plant. Further, the most valued varieties of tobacco do not grow on the heavier types of soil which contain the larger supplies of moisture.

#### MEAN MONTHLY PRECIPITATION.

—	April.	May.	June.	July.	Aug.	Sept.	Total for six months.	Latitude.
	in.	in.	in.	in.	in.	in.	in.	deg.
Connecticut Valley	3.33	3.78	3.79	4.90	4.86	3.85	24.51	41.45
Beloit, Wisconsin..	3.30	3.88	3.80	3.55	2.86	3.60	20.99	42.30
Pelee Island .....	3.09	3.68	3.05	3.38	2.06	1.98	17.24	41.50
Windsor .....	1.88	2.98	3.42	3.16	2.51	2.14	16.09	42.20

The above figures show the mean rainfall by months from April to September, which period completely includes the growing season. The four points compared are the Connecticut Valley, in which district a high grade of cigar wrapper leaf is produced, as well as binders and fillers; second, Beloit, Wisconsin, which is about the centre of one of the tobacco districts in Wisconsin. Here a high grade of binder leaf is produced, as well as some wrappers and fillers. Pelee Island, the most southerly point

in Ontario and in Canada, and Windsor, chosen to represent the Walkerville district, and approximately the whole of the tobacco district following the lake shore from Windsor to Blenheim. Of these four points, the rainfall in the Connecticut Valley is about 24.5 inches for the six months; in Beloit, Wisconsin, it is 21 inches; in Pelee Island a little over 17 inches, and at Windsor about 16 inches. In these respects the Connecticut Valley and the Wisconsin district would likely produce a heavier yield per acre, other conditions being equal, than the Windsor district. The rainfall at Windsor, however, is sufficiently uniform in distribution to maintain a continuous growth. Such has been the experience in tobacco growing there; and this year, though it has been unusually dry, is no exception to the average experience, except in instances of late planting.

2. *The Mean Monthly Temperature.* The principal varieties of tobacco appear to be of southern origin and of tropical or semi-tropical habits of growth. Tobacco generally requires a warm soil for germination and a warm soil and air for growth. It is tender, and easily injured by temperatures below the freezing point. This is true at both ends of the season; and, therefore, the tobacco plant has to be grown in the field well within the period that is free of frosts; and, besides, this period must have relatively high degrees of temperature to insure the ripening of the plant.

The following are the mean monthly temperatures from April to September, inclusive, for the four points above mentioned:

MEAN MONTHLY TEMPERATURE.

—	April.	May.	June.	July.	Aug.	Sept.	Mean six months.
	deg.	deg.	deg.	deg.	deg.	deg.	deg.
Connecticut Valley.....	44.8	56.5	65.9	70.2	67.7	61.1	61.0
Beloit, Wisconsin.....	48.0	57.8	69.0	73.3	70.6	62.4	63.5
Pelee Island.....	44.1	57.2	68.3	74.4	73.2	65.2	63.7
Windsor.....	45.7	58.2	67.4	72.7	70.0	62.6	62.8

With respect to the above temperatures, it is interesting to note that the Connecticut Valley and Pelee Island are on almost the same latitude, and that Beloit, Wisconsin, and Windsor are within ten miles of latitude of one another. The temperatures at Pelee Island are slightly higher, especially during July, August, and September than are those in the Connecticut Valley. This is due, undoubtedly, to the more inland situation of Pelee Island and to the influence of the ocean in moderating the summer temperatures of the Connecticut Valley. Comparing Beloit and Windsor, we see that the former has slightly higher temperatures in June and July, with a difference in the average of six months of only .7 degree F. So far as these figures can be taken as a guide, either Pelee Island or Windsor should furnish equally favorable conditions of temperature with Wisconsin or the Connecticut Valley. Pelee Island particularly seems to have the required conditions of temperature for producing the type of tobacco that has made the Connecticut Valley famous.

3. *Mean daily range of temperature.* The mean daily range of temperatures for a given point, are obtained generally by taking the average difference between the highest, or maximum, temperature of the day and the



lowest, or minimum, temperature of the night for the same twenty-four hours. It is obvious that where high day temperatures occur, they may occur alternately with low night temperatures, producing a relatively high mean temperature but occurring along with occasional frosts. This climatic factor is expressed by the term "daily range of temperature." Arithmetically, the daily range is determined by subtracting the minimum from the maximum. A high daily range is characteristic of inland conditions distant from the tempering influences of water. A high daily range is synonymous with late spring frosts, even when the mean temperature has attained a high degree. A low daily range means warm nights and immunity from frosts. I have been unable to secure a statement of the daily range of temperatures for Beloit, Wisconsin, but submit the following figures for the other three points:

#### MEAN DAILY RANGE.

	April.	May.	June.	July.	Aug.	Sept.
	deg.	deg.	deg.	deg.	deg.	deg.
Connecticut Valley .....	21.3	22.5	22.1	21.6	20.1	20.4
Beloit, Wisconsin .....	.....	.....	.....	.....	.....	.....
Pelee Island .....	7.2	7.9	7.6	7.7	7.5	8.1
Windsor .....	16.7	19.5	18.6	18.8	18.9	16.4

A comparison of these figures demonstrates the relative fitness of the Southern Ontario districts for tobacco growing in their comparative immunity from frosts during the growing season. In this respect both points are superior to the Connecticut Valley, a state of things which I cannot entirely explain. It is well known that low lying fields have greater daily ranges of temperature than upland districts or mountain sides. The high daily range in the Connecticut Valley may be due to its low altitude, producing intense heat during the day, and by air drainage from the surrounding uplands, producing comparatively low temperatures during the night. Windsor, being situated immediately on the River Detroit and the surrounding country affording air drainage to that river, the daily range of temperature is low. Pelee Island, being a small tract of land in the midst of a comparatively large body of water shows a remarkably low daily range.

There is a fourth factor of climate of the highest importance in tobacco growing, and that is the relative humidity of the atmosphere. This is of importance both in the maturing of the plant, and in the curing of it. It is so important in the curing that it compels a difference of one month in the dates of planting and of harvesting between the Connecticut Valley and Wisconsin. It is somewhat difficult to secure exact figures giving the measure of the relative humidity at any point. It is not altogether expressed by the amount of precipitation. Two points having the same precipitation may vary widely in the average humidity of the atmosphere. One point may have frequent light rains, much fog, and a high percentage of cloudiness, all of which conditions are conducive to high humidity. Another point with the same average rainfall may have heavy, infrequent showers with little fog and a high percentage of sunshine. Generally

speaking, the former state of affairs belongs to water fronts and maritime districts, while the latter series of conditions belongs to inland districts. In relative humidity, therefore, it may be estimated that of the four points chosen the Connecticut Valley stands highest, Pelee Island second, Windsor third, and Beloit fourth. Here again, though the influence of this factor is very marked, yet the difference between two points can be determined only by experiments. The general indications, however, are that the practices in Southern Ontario, so far as they will be governed by the humidity of the atmosphere, would be somewhat midway between the Connecticut Valley and Wisconsin, inclining more nearly to that of Wisconsin. I find this to be the case in the matter of the date of harvesting.



FIG. 2. Showing a field of "White Burley," grown in Essex Co., Ont.

These climatic factors have each their separate influence on the tobacco industry. It might not be difficult to determine the influence of each factor by itself, provided the influences of the others could be eliminated, but since this is impossible, the actual effect of the combined differences cannot be predicted with any degree of certainty. The most that can be said in this connection is that the climatic conditions in Southern Ontario along the water front from Windsor to Blenheim and in the Niagara and Grimsby districts appear highly favorable to the producing of a cigar leaf equal at least to that produced in Wisconsin, and there is strong probability that immediately along the water front a good type of cigar wrapper can be produced by growing the Connecticut Broad Leaf.



### THE INFLUENCE OF SOIL ON TOBACCO.

The influence of soil on the quality and yield of tobacco may be considered under two heads: first, the chemical influence or the influence of the degree of fertility, the amounts and proportions of plant food distributed in the soil; secondly, the physical influence, depending upon the texture of the soil, that is to say, the proportion of sand, silt and clay, making up the mineral constituents. "Under given climatic conditions the class and type of tobacco depend upon the character of the soil, especially on the physical character of the soil upon which it is grown," (Whitney, "Tobacco Soils of the United States.") Of course, tobacco can be grown like any other crop on almost any soil, but if a certain particular quality of leaf is desired, then the soil must be carefully selected as suited to the development of that leaf. As a general rule, the heavier types of tobacco are produced on the heavier soils, while the finer grades are almost without exception found growing on sandy or sandy loam soils. The texture and physical properties of the soil more than any other soil factor control the distribution of the distinct types of tobacco.

While the physical character of the soil exerts a most important influence on the type and quality of tobacco grown on it, the fertility of the soil has a most marked influence on the quantity of the yield. Provided the soil is in normal condition, not excessively depleted of fertility and able to produce healthy plants, then manures and fertilizers added to it increase the yield without influencing to any marked degree the quality of the leaf. The exception to this occurs when an excess of nitrogen is found in the soil, producing a thick, heavy, gummy leaf. The tobacco plant draws heavily upon potash, and both manures and fertilizers which are added to the soil should contain a large proportion of this constituent. Besides this, of course, cultivation will improve both the quality and the yield of the crop, but no amount of cultivation and no amount of manuring and fertilizing, however, well timed and intelligently applied, will produce a fine silky leaf on a heavy type of soil. I found no exception to this rule during my visit to Connecticut, Wisconsin, and Southern Ontario, and the same rule is stated in publications dealing with tobacco growing of the United States Department of Agriculture. The type of soil, therefore, suited to the finer grade of leaf, such as can be used for cigar binders or wrappers or plug wrappers, is a sandy loam, sufficiently supplied with humus, and having below it a deep sandy stratum affording good drainage and yet close enough to retain large supplies of moisture. Good drainage is essential, and the soil which does not provide it naturally must, in order to produce any crop of tobacco with success, be thoroughly underdrained. Generally speaking, the soil which has below it a subsoil affording good natural drainage is better for the finer grades of tobacco.

### THE TOBACCO SOILS OF CONNECTICUT, WISCONSIN, AND ONTARIO.

Below is given a report of the mechanical analysis of three soils from Connecticut, three from Wisconsin and two from Ontario. The Connecticut soils were gathered from one farm, and that one of the best in Connecticut where tobacco had been grown almost continuously for thirty years. The Wisconsin soils were taken from the neighborhood of Janesville, Wisconsin, and represented pretty well the tobacco soils of that dis-

trict. The Ontario soils were taken, one from Leamington,—this one being, so far as I can judge, an average sample of tobacco soil in that district; the other from Walkerville, from the farm of Walker Bros.

		Gravel	Sand	Silt	Clay
Connecticut	1.....	2.8	76	18	6
"	2.....	9.4	69	24	7
"	3.....	2.2	63	27	10
Wisconsin	1.....	0.0	17	70	13
"	2.....	0.7	55	25	20
"	3.....	0.0	11	75	14
Leamington, Ont.,	1.....	1.7	81	11	8
Walkerville, Ont.,	2.....	2.9	45	32	24

The analysis of the Connecticut soils shows, first of all, that they are of a sandy type. Within this type they vary, as may be observed, as much as 13 per cent. in sand content and as much as 9 per cent. in silt content. The first of these soils is regarded as the lightest type on the farm from which the samples were taken, and so the report shows. The foreman of the farm was unable to distinguish any difference in the physical character of No. 2 and No. 3. They seem to cultivate in about the same way, but No. 2 gave rather a slow growth of tobacco, while No. 3 started the crop more quickly and matured it somewhat earlier. I am not sure that the physical differences, as shown by the analysis, are sufficient to account for this difference in action. No. 3, the quicker soil, has a larger percentage of clay, which certainly does not account for the stated difference in action. It has a much smaller proportion of sand, and a much smaller proportion of gravel. Whether the gravel in No. 2 has any effect in the direction indicated or not, it is hard to say. Evidently these two soils exhibit the extreme sensitiveness of the tobacco crop to physical conditions. There is a marked difference in action, but the physical differences shown by the analysis seem scarcely sufficient to account for the results.

These soils are producing year after year the finest grade of wrapper leaf. They may be taken, therefore, so far as soil is concerned, as the requisite condition for production of a leaf of that type.

Coming now to the Wisconsin soils, we note that they are decidedly heavier throughout than the Connecticut soils. The average clay content of the Connecticut soils is a little less than 8 per cent.; the average clay content of the Wisconsin soils is a little less than 16 per cent. The Wisconsin soils also are practically free from gravel. The types of tobacco grown in Wisconsin, as has already been pointed out, are principally those producing a binder leaf, requiring strength, elasticity, and fineness of texture. No. 2 soil of this group is new land, and this year is producing its first crop, and that of tobacco. The leaf which I examined, in company with an expert, was a thin gummy leaf of fine texture, highly suitable for a binder leaf. It is a question with regard to these soils if they can produce, even if climatic conditions were favorable, the same grade of leaf that the Connecticut soils produce.

We come now to the two Ontario soils. The Leamington soil has 8 per cent. of clay, which is the average per cent. of the three Connecticut soils. It differs, however, from the Connecticut soils in having a generally coarser texture. The Connecticut soils average 69 per cent. of sand,



while the Leamington soil has 81 per cent. of sand. The gravel content of the Leamington soil, is, on the other hand, less than that of the Connecticut soils. On the whole, this soil in physical character compares very favorably with the wrapper type of soil of Connecticut. The Walkerville soil, on the other hand, is the heaviest of all types examined. This fact is quite evident upon a cursory examination of the soil in the field. It is a markedly heavy soil, and I believe that no attempt is being made to grow the finer grades of leaf upon this farm. Principally a leaf for the manufacture of chewing tobacco is produced here.



FIG. 3—Showing a field of "Ohio Seed Leaf" grown in Essex County, Ont., with an immense re-drying plant in the background.

#### TOBACCO GROWING IN CONNECTICUT.

The best farm that I visited is situated about eight miles from the city of Hartford, Conn., at Buckland. It belongs to Messrs. Hartman, of Hartford, tobacco growers and packers. It consists of a little more than 65 acres, and 65 acres of tobacco are growing this year.

The soil is a sandy loam with evidently three slightly differing grades. The sensitiveness of the tobacco plant to slightly varying conditions is seen by noting the slight differences in these soils and the marked difference in growth of the tobacco. Tobacco is grown continuously on the same soil without rotation. It is fertilized by horse manure, brought from New

York. This horse manure is supplemented by the application of commercial fertilizers, one of which is cotton seed meal. Another fertilizer used is the following:

5.50 to 6.50 per cent. Ammonia.

3.00 to 4.00 per cent. Phosphoric acid available.

5.50 to 6.50 per cent. Actual potash.

*Sowing Seed.* The seed is sown in hot beds about April 1st. These hot beds are ordinary frames sloping to the south, covered with glass and provided with hot water pipes. Before sowing, the seed is soaked in vegetable mould of some sort, preferably apple tree mould, containing rotten pulp from old apple trees. One teaspoonful of seed is sufficient for a square rod of ground. In mixing the seed and the pulp, five tablespoons are put with a pail of the pulp. This is kept hot in the boiler house for about five days allowing the seed to sprout in the pulp, then it is sown. In fertilizing these beds, cotton seed meal is applied in the fall, 100 pounds to 325 square feet; then a cover of four inches of horse manure is applied on top and in the spring this is raked off.

*Planting.* Planting is begun about May 15th. The plants are set by machinery. The planting machine consists of a large barrel suspended between two wheels, the barrel furnishing water for moistening the soil. Behind the barrel runs a plow point, which cuts a small furrow in which the plants are to be laid. On each side of this plow point, and slightly behind, is a seat, so that the machine carries two men for planting. These men lay the plants alternately in the furrow as the machine moves along. Behind the plow point and attached to the same beam are two blades, slightly tilted and set about three inches apart. The blades draw the earth in close to the plants and pack it, so that the plant is completely set out when the machine has passed over. The machine requires three men and a team to operate it, and with this outfit three and a half acres a day can be planted. There are different forms. One of the best is made by the Bemis Co., Springfield, Mass., cost, sixty dollars. The early planting, resulting in early maturity, is found to be best in Connecticut, as a rule, because the leaf should be cured there in warm weather at high temperature for best results.

*Cultivation.* In the autumn manure is applied and the land is plowed shallow, so that the manure may be covered. In the spring it is plowed again, a little deeper, then one application of fertilizer is put on broadcast, then the Acme harrow is used to pulverize the soil and mix the fertilizer with it. Then the leveller is used, the chief part of which consists of planks for levelling and pulverizing; then the land is ready for planting. In summer cultivation, while the plants are still small, the small shoe cultivator is used. Later the cultivator with the broad shares is used, and last of all, in July a special form of cultivator, called the Prout hoe (manufactured by Olds and Whipple, Hartford).

*Harvesting and Curing.* Harvesting commences about August 1st. By means of arrow points fitted over laths, the plants are run upon the laths, and are suspended by supporting the laths across scantling in the shed. Successive tiers of plants are thus suspended until the shed is filled from roof to floor.

Great care is required in the curing of tobacco in the shed. The commonest form of destruction in Connecticut is that called Pole Sweat, or rot in the shed, caused by damp weather or want of ventilation.

*Selecting Seed.* As the flower buds appear the tops are cut off and plants are kept topped, topping the larger ones so as to keep them as nearly



even as possible in growth and maturity. Harvesting generally commences two weeks after the last topping. For seed the best plants in the field are selected and the buds left. These plants are left untouched in harvesting and the seed collected separately. Seed plants are usually ripe about October 1st.

*Tobacco under Cover.* This year there is on the farm one-half acre of tobacco under a cheese cloth cover as an experiment. The plants here are much more even in size, are farther advanced than those in the open field, also the leaves are sounder on account of freedom from wind and heavy rain. It remains to be seen if the increased value of the crop, resulting from more uniform growth, immunity from frost, and other weather damage, will repay the cost of cover.



FIG. 4. Curing shed for tobacco.

*The Connecticut Wrapper.* The variety of tobacco grown in Connecticut is generally the Connecticut Broad Leaf. Connecticut tobacco is especially known as the wrapper type, that is, it furnishes a leaf specially suited for the outside wrapper of cigars. The form of leaf that is most desired for the Connecticut wrapper has a rounded end. I noticed here and there over the field plants of a peculiar spotted appearance. Upon inquiry I found that this is a disease whose origin and cure are unknown. It is called the calico or mongrel plant. This calico plant is smaller than the normal ones, and frequently the calico spotting may change to rust, which destroys the plant entirely. At best the leaf may grow into the binder type.

Each plant may produce leaves, first, for wrappers; or, second, for seconds, or binders; or third, the top leaves for cheap fillers. The first two, wrappers and binders bring from eighteen to thirty cents per pound, the fillers about five cents a pound. The average crop is 1,800 pounds per acre, 30 per cent. of which may be wrappers.

## TOBACCO GROWING IN WISCONSIN.

The specialty produced in Wisconsin is known as the binder leaf, and this leaf is used by Canadian manufacturers and others in the manufacture of a high grade cigar. The chief variety grown in Wisconsin producing this leaf is known as Comstock's Spanish. In the many plots that I saw in the neighborhood of Janesville, Wis., this Spanish leaf predominated. There were, besides, the Connecticut Broad Leaf, Old Spence Seed, the Silver Leaf, (which produces a very broad leaf), the Narrow Leaf Spanish, and one or two other miscellaneous varieties.

There was a marked difference in the shape of these leaves. The proper leaf for the binder variety, as well as for furnishing some wrappers, is a broad, round tipped leaf. Many of the leaves, however, as for instance, the Narrow Leaf Spanish were distinctly narrow in shape and sharp at the point. Besides the shape, the texture is, of course, an important property in the manufacture of binders. A fine, silky, elastic texture is the desired quality. The best leaf that I saw growing in Wisconsin fields was the Comstock Spanish on a piece of new land. For some reason, not clearly known, new land produces a finer quality of leaf than land that has been in cultivation for some time. Consequently, it is found advisable either to follow a rotation of crops, or, at least, to plant tobacco for three years in succession, and then to change the ground and plant other crops for a year or two, so as to renew the elements in the soil on which the tobacco has existed.

The soils used in Wisconsin for growing tobacco are all distinctly of the sandy type. There is, of course, a marked variation in the amount of vegetable matter present in the soil, but the mineral foundation should not verge on the clay type. A sandy loam, containing a large proportion of black vegetable matter, such as would be present in a virgin prairie soil, is found to be the ideal condition for tobacco in Wisconsin.

A marked difference between the practice of Wisconsin and that of Connecticut is in the dates of seeding and harvesting. It is found that to harvest early in August in Wisconsin is likely to produce a dry, withered leaf in the curing, while in Connecticut it is found desirable to harvest as early as possible in order to take advantage of some of the heat of the summer for curing. This difference in result is likely due to difference in climatic conditions. The moist marine atmosphere of Connecticut prevents excessive drying in curing, and necessitates a fairly high temperature to prevent what is called "pole sweat" in the shed. Whereas in Wisconsin the inland conditions, inducing a drier atmosphere, make cool weather more favorable to curing. I believe that the practice in southern Ontario leans toward that of Wisconsin in this particular rather than toward that of Connecticut.

In Wisconsin the seed is sprouted in fine wood mould, sifted. First warm water at about 70° F. is poured on the seed, which is soaked for one-half day, and then mixed with mould. This is kept damp and the seed sprouts in about three days, when it is sown in the beds. After scattering the seed on the beds, the surface of the beds is packed firmly, and then soaked with water and covered with one-quarter of an inch of sand. Usually the plants will show through the sand in four days. The sowing of the seed usually takes place about the 10th of April, and when the stems are about three inches in length the plants are ready for machine planting. Planting is done as near the 15th June as possible, and harvesting from the 15th August to the 1st September. The same sort of machine is used in



Wisconsin as in Connecticut, and it is found that the machine planting is more even in its results and more sure on account of the watering, which is part of the process, than hand planting.

In cultivating for tobacco the approved practice in Wisconsin is to plow in the early fall, top dress with manure, and plow again lightly in the spring, then harrow to form the seed bed. After planting, cultivation is carried on much as in Connecticut. I observed one instance of the bad effects of too late cultivation. When the root system of the tobacco is extended broadly between the rows, it is unwise to cultivate, or, if it is absolutely necessary to cultivate, then it should be done as shallow and as narrow as possible, in order to avoid pruning the roots.

In Wisconsin early curing, as has been stated, results in excessive drying of leaf. Where the crop is ripe and harvested in hot weather, excessive drying may be prevented by throwing water on the ground in the shed. The shed is closed in the day and opened up at night.

#### VARIETIES OF TOBACCO.

*White Burley.* The White Burley is at present, and will likely continue to be, the principal variety of tobacco grown in Ontario. Its fitness for Ontario conditions seems to have been thoroughly demonstrated, and a profitable market is afforded for this variety by the Empire Tobacco Co. This crop is found growing in greatest abundance, outside of Ontario, in Kentucky. It is, of course, a low grade variety, and is used entirely, I believe, in the manufacture of chewing tobacco; but it is a heavy yielder and works in well in rotation with other crops which are grown in Southern Ontario. Unlike some other varieties, it cannot be grown profitably without rotation; the usual practice is to use the White Burley tobacco in the ordinary rotation.

The following estimate of the profit of this crop was furnished me by the Empire Tobacco Co.: Average yield per acre 1,300 pounds of cured, stripped tobacco; average price nine and a quarter cents per pound. The gross revenue from this would, therefore, be \$120; the cost of growing and curing is estimated at \$45, giving net profit of \$75 per acre. It may be asked, if the profit per acre is so high as this, why is it not grown even more extensively? In reply to this, I may say that, in the first place, much more than average skill and care are required in the growing of the crop. The plants are difficult to propagate and difficult to start in the field. The land has to be in first-class condition, in quality and tilth for seed bed, and the cultivation has to be carried on systematically throughout the growing season. After this, the curing is a costly and hazardous process. In the second place, this average yield has been attained in a comparatively narrow district, within three or four miles, at the most, of the lake shore. The growing of tobacco outside of the immediate influence of the water would be more hazardous and likely less profitable.

White Burley is cured after the usual fashion of air curing. A typical shed is 36x100 feet. This will contain ten acres of tobacco. Every fifth board, or thereabouts, on the siding of the shed is hinged so as to swing outward and allow a free movement of air through the shed. The interior is furnished with posts and scantling for the support of the tobacco. In the field the tobacco plants are run on a lath by means of a sharp arrow-shaped steel needle, fastened on the end of the lath. This needle pierces the stalk of the plant and the lath is run through the stalk and in this way the lath is filled with as many plants as can be strung upon it. These

bunches are then hauled to the shed and hung between scantling, the projecting ends of the lath being supported by scantling. The different tiers from top to bottom of the shed are put in until the whole shed is filled. The tobacco is then left there to air-dry until the snap has been removed in the right quantity and the leaf is in proper condition for stripping and bulking into "hands." The length of time required for this curing depends of course, upon the character of the season, upon the temperature and humidity of the air during the time of curing. A great deal of tobacco is spoiled either by drying too rapidly and "haying out," as it is called, or by standing too long with the green sap in and "pole sweating." After the tobacco is cured, the leaves are stripped from the stalk and it is then in condition for handing over to the manufacturer. Tobacco is quoted at so much per pound, reckoned on the stripped leaf, that is, after the leaf has been stripped from the main stalk.

*Bright Virginia Tobacco.* This variety, as was stated above, has its home in Virginia and the Carolinas, and it is used for plug and cigar wrappers and for plug fillers. The growing of this crop in Ontario has not yet been experimented with on a large scale, so that the probability of growing it commercially with profit is not by any means assured. The success, however, of the White Burley in Ontario, as compared with the same variety in Kentucky, suggests the reasonableness of expecting success in the growing of Virginia tobacco. The Erie Tobacco Co., as was stated above, are growing a few acres of this crop this year along with an experiment in the curing of tobacco.

The process of curing the Virginia tobacco is different from that used in curing either White Burley or the finer grades for cigar leaf. In Virginia and the Carolinas the following process is used almost exclusively: A shed is built, air-tight, about nineteen feet square, large enough to contain the produce from one acre. The tobacco is hung in the shed after the fashion similar to that used in curing the Burley tobacco. Instead, however, of depending upon the ordinary atmospheric temperature, the building is furnished with two furnaces built at the ground level under the wall at one end of the building. These furnaces are about seven feet in length and two feet in diameter, built of brick in the form of an arch. The furnaces project about five feet inside the wall of the building at the ground. From the inner end of each furnace, the smoke pipe runs around the wall and after circling about, passes out through the outside wall. The furnaces are kept supplied with fuel, night and day, and the heat from the smoke pipes and furnaces keeps the temperature of the building up to a maximum of 120 degrees. After the green tobacco is in, the temperature is raised gradually to 110 degrees, and is kept at this point until the leaves have bleached to the required color. This process is called "yellowing." The temperature is then gradually raised to about 120 degrees for drying. Altogether this kiln curing requires about three days and nights. By ordinary air curing, the time required may be as long as three months. The advantage claimed for this kiln is that it is watched closely, the temperature is immediately under control, and the color and texture of the leaf may be thereby brought out exactly as required.

A building of this sort was in process of erection and nearly completed on my visit to Ruthven, Ont., and since then I have received samples of the tobacco cured by this process. Whether or not the leaf grown here is equal in quality to that grown in Virginia has not yet been determined.

*Spanish Leaf.* Spanish of one variation or another is the principal variety grown in Wisconsin. The Zimmer or the Comstock Spanish appears



to furnish the most desirable leaf for the manufacture of binders. It is a large leaf, measuring from 20 to 30 inches in length, and from 10 to 20 inches in width. The choicest of these leaves will furnish many wrappers, but in Wisconsin the specialty is high class binder, and the manufacturers of high grade cigars in Ontario use the Wisconsin binder leaf along with the Havanna filler and Sumatra wrapper. The curing of this leaf is similar in process with that of the Burley.

*The Connecticut Broad Leaf.* This leaf is similar in appearance and size with that of the Spanish. It is, however, somewhat finer and silkier in texture, though the difference may be as much due to climate as to variety. It is the sort grown principally in Connecticut for furnishing the wrapper.

The average crop, either of the Spanish or Connecticut Broad Leaf, will yield slightly less per acre than the White Burley. A good stand of the Spanish will furnish about thirty per cent. of the total weight in binder, the rest being second-class fillers. A good stand of the Connecticut Broad Leaf in Connecticut will furnish about the same proportion of wrapper.

As to these varieties and the advisability of attempting to grow the untried ones in Ontario, it depends upon the point of view. If the object is to conduct a scientific experiment, merely to demonstrate the possibility of growing plug leaf and cigar binder or wrapper of a high grade in Southern Ontario, then I venture to say that the experiment is well worth conducting and will likely prove the fitness of Ontario soil and climate to produce a high grade leaf of these varieties. But when this has been demonstrated, the information thus gained is only of scientific value, and cannot be made of commercial value until the market conditions and until the laws respecting the manufacture of tobacco have been modified. Years ago the growing of White Burley in Ontario was as problematic as the growing of any other variety. It is altogether unlikely that farmers could have been induced to grow it in any large quantity unless they have been at the time assured of an immediate and profitable market. Tobacco is a crop that cannot be held over by the grower without exceptional facilities. It certainly cannot be manufactured by him, nor used by him, nor sold in the open market. The farmer needs to see beforehand whether he can dispose of his tobacco crop quite as much as he needs to arrange for the sale of milk or cream if he proposed to go into that business. This is the secret of the Burley crop in Ontario to-day, namely, that the Company guarantee the immediate and ready sale for the crop, provided the farmers will grow it. Now only that, for the first two years, seed was furnished and instructions given for the cultivation of the crop. What would be the conditions facing the farmer who should undertake to grow, say, five acres of Connecticut Broad Leaf in Southern Ontario next year? He might actually be able to produce a leaf as fine in texture and as suitable for wrapper as that grown in Connecticut. If he should do this, and if the manufacturers of tobacco should be assured as to his success, he would still be unable to sell his crop profitably. Manufacturers who handle Canadian grown tobacco are compelled to hold a special license, and if the Canadian grown tobacco is to be manufactured at the same factory with foreign grown tobacco, but not in combination with the latter, two separate places and outfits are required by law. No Canadian manufacturer would undertake the expense of two outfits, unless there were sufficiently large supplies of Canadian tobacco, and that of the right quality, in sight. The present state of the law respecting licenses would, therefore, prevent the farmer from

finding a profitable market for a high grade leaf. Not only that: the law respecting the stamping of tobacco would operate against the Canadian grown leaf, even though of high grade. The present law requires a green stamp for Canadian grown tobacco, a pink stamp for a combination tobacco, a black stamp for foreign grown home-made tobacco, a blue stamp for tobacco of foreign growth and manufacture. There is at present a prejudice against Canadian grown tobacco. The stamp required by law, marks home grown tobacco, and, in the present state of opinion, prejudices it in the minds of the consumers, so that whatever grade a farmer might succeed in producing in Ontario, he could not, for these two reasons, expect a proportionately good price. It seems likely that in the present state of the tariff a profitable market will not be found for any higher grade of tobacco than is at present produced.

#### RECOMMENDATIONS RESPECTING THE EXPERIMENTAL GROWING OF TOBACCO.

The climatic conditions in Essex and Kent appear to be favorable for the growing of finer grades of tobacco than are being grown at present. The climatic conditions of the Niagara district and of the Grimsby district seem also to be favorable to the production of the finer grades of tobacco. In all of these districts soil types in abundance may be found, on which the finer grades of cigar tobacco can be grown. In general, what is known as a peach soil, that is, a soil generally sandy in character, well drained, and fertile, is eminently suitable for cigar tobacco.

Variety tests, to be conclusive, must be conducted in the same district, and, in fact, we may say, upon the same soil on which it is intended to grow these varieties commercially. Tobacco, as has been pointed out, is so susceptible to small local influences of climate and soil that a test conducted in one district under certain conditions would not be conclusive if applied to another district in which the conditions seem to be very similar. Therefore, if certain varieties are to be tested for recommendation to growers in the southwestern district, those varieties must be tested there.

On the other hand, there are many important lines of experiments in tobacco growing other than variety tests. Among these are: First, the method of growing plants. In the Leamington district I learned that many of the growers, either through neglect or through unacquaintance with the proper methods, are not in the habit of raising their own plants, but purchase them wherever they can be procured. What is needed in this direction is a series of experiments to determine the surest and best method of germinating the seed and rearing the young plant for the field.

Second, the dates of planting and harvesting. As I pointed out elsewhere in my report, there is a wide difference in practice between the three districts that I have visited, in these matters, and even in southwestern Ontario there is a difference of more than a month between the earliest and the latest planting. It is doubtful if a month's delay can be afforded in producing the tobacco plant, for, I believe, the seasons in Ontario are none too long for best results. To determine, then, the best date for planting and also for harvesting, with a view to securing the best conditions for growing and curing would be an important line of investigation.

Third, methods of cultivation and fertilizing. On one farm in Connecticut that I visited, for which manure and fertilizers are all bought, the annual outlay for these is between \$50 and \$60 per acre. Fertilizing alone here costs about 3 cents per pound of tobacco produced. While it is agreed



that manures or fertilizers rich in potash rather than in nitrogen are best for tobacco, nevertheless, the exact form of manure or fertilizer as suited to the conditions of the Ontario farm, requires careful investigation.

Fourth, the method of curing tobacco is a feature requiring investigation. Air curing is the method generally in vogue in Ontario, but another method, described earlier in this report, is being introduced at Ruthven, Ont., under the direction of the Erie Tobacco Co., namely, that of kiln drying. How far the latter process may with advantage be carried on is yet to be determined by experiment.

Fifth, perhaps the most important question for investigation is that of breeding a variety of tobacco suited to the climatic and soil conditions of Ontario and furnishing the required characteristics of leaf. This line of investigation falls under the general one of plant breeding. The tobacco plant responds very readily to the efforts of the plant breeder. By selecting in the field plants that exhibit the desired qualities of leaf, or possibly by cross-breeding one variety with another, there is no doubt that a type of tobacco specially suited to our Ontario conditions, and of high quality, can be produced in a comparatively short time. This line of investigation particularly requires expert attention, and cannot be conducted with success through the medium of volunteer experiment stations.

While the variety tests need to be conducted or confirmed on the spot where the commercial results are to be obtained, yet these lines of investigation last mentioned, being general in their character, may be conducted at the Experimental Farm at Jordan. The climatic conditions there are even more favourable, in my judgment, than those in the southwestern district. On this farm, at the north end, there is, I think, soil suitable for tobacco growing. Therefore, the growing of plants, the dates of planting and harvesting, methods of cultivation and fertilizing, and methods of curing can be investigated there, and the results applied with tolerable certainty in the present tobacco district. If this is to be done, it appears that the best method of insuring satisfactory results is to secure the services of an expert tobacco grower, who will be under the direction of the Superintendent of the Jordan Experimental Farm. In addition to this branch of work at the new Experimental Farm, variety tests may be conducted at different points in southwestern Ontario where tobacco is not grown, after the same manner as the present Fruit Experiment Station work.

After all this is done, it must not be forgotten that the proof of the quality of tobacco is in the smoking; and it appears, therefore, before conclusive reports can be handed out to the public as to the growing of any particular variety in Ontario, that arrangements must be made for giving the product fair test in manufacture, with expert reports on the same. This may be managed through the Ontario manufacturers; but, however it is to be done, there is no doubt that an impartial manufacturing test should be given if the higher grades of cigar tobacco are to be produced in Ontario.

## BUILDING UP A RUN-DOWN FARM.

By E. C. DRURY, B.S.A., CROWN HILL.

Throughout the country there are many farms that may properly be described as "run-down," though there are many different grades of depletion. Such farms have greatly deteriorated from their virgin condition, and, though they may not have reached that stage where it is no longer profitable to work them, still it is safe to say they are doing far less than their best. If by any profitable method of farming, and without too great expense these

may be restored to their former good condition, it will mean much both to their owners and to the community at large.

Perhaps a little enquiry into the history of these farms may help us to a clearer understanding of their condition, and of the remedies to be applied. In nine cases out of ten these farms, since they were cleared out of the forest, have been grain-producing and grain-selling farms. Wheat, oats, barley, peas, and timothy hay have been the staples of production, and with the exception of feed for a few horses, a cow or two, and enough young cattle "to work the straw into manure," with possibly a few pigs and sheep, all this has been sold off the farm. On these farms rotation of crops has not been followed to any extent, the different crops being placed wherever, and in whatever order, the farmer's fancy dictated, without any regard to their effect on the land, or on each other. When the land on these farms becomes foul with weeds, as it soon does, owing to depleted fertility, recourse is had to a bare summer-fallow to clean it. Summer-fallowing is also sometimes practised with a view to increasing the soil's fertility. It will be noted that the practice followed on these farms results in returning very little vegetable matter to the soil, since very little barnyard manure is produced, and since the crops grown have very little "crop residue," i.e., roots, stubble, etc., to be plowed under; in the exposure of the soil to the effects of the air in bare cultivation, for comparatively long periods, since bare cultivation almost invariably forms an important part of their practice; and in the actual removal of large quantities of plant-food from the farm, in the crops sold.

The effect of this on the soil is exceedingly harmful. As the result of cultivation, unaccompanied by the return of vegetable matter, the soil becomes poor in humus, approaching in its character that of the unproductive sub-soil. Cultivation invariably results in the oxidation of the vegetable matter in the soil; and in fertile soils, and those plentifully supplied with humus, this is desirable and beneficial, but in soils where very little vegetable matter is returned it results in the disappearance of the humus. Light soils become lighter, and suffer to a greater extent from the effects of drouth; and heavier soils, clays, etc., become heavier, run together and bake, and become exceedingly difficult to cultivate. This lack of good physical condition leaves the soil very much at the mercy of the weather. It cannot resist either wet or dry weather, and unless the season is exceptionally favorable, a poor crop is the result. Again, the poverty of actual plant food results in a poor, unprofitable growth of crop and in a corresponding liability to weeds, since weeds will grow wherever the crop is poor, thriving under conditions that stunt and retard our useful plants.

The improvement of these lands, then, will consist in the introduction of large quantities of humus, or vegetable matter, to improve the physical condition of the soil, in the supplying of plant-food in a form available to crops, and in the destruction of weeds. The manner in which these are to be accomplished will depend on circumstances. If the owner of the land wishes quick results, and has a good supply of cash, he may buy manure or chemical fertilizers, use them to obtain a growth of vegetable matter, and, plowing this "green manure" under, supply the soil with humus, and with plant-food as well. At the same time thorough cultivation, combined with the smothering effect of more vigorous crops, may be used to clean the land of weeds. This method is very effective, but is expensive, as it involves the sacrifice of a paying crop, and a large cash outlay. It could scarcely be practised to any large extent by a farmer who depended on his farm for a living. If a depleted purse goes with depleted land, as it too often does, other methods that will allow of the growing of crops continuously, and that



will call for very little cash outlay, must be used. The farmer must depend on the recuperative powers of Nature, wisely directed. Fortunately these alone are sufficient to restore the fertility of the most run-down farms in a comparatively short time.

Plant-food is required. How may we get it without a cash outlay? From the air and the soil, and by husbanding most carefully each fresh supply as we get it. Nitrogen, phosphoric acid, and potash are required. The first may be obtained in abundance from the air by the growth of clovers, peas, and other members of the legume family, which have the power to take the free nitrogen of the air, convert it into the form of vegetable matter, and to leave it in the soil in that shape, for the use of other plants. The others, potash and phosphoric acid, may be obtained by the decomposition of the soil particles themselves. Thus in the air and earth we find the source of our cheap store of fertility. It is for us to use means to concentrate it near the surface of the soil, so that our crops may use it.

A rotation containing clover as often as possible will be the first step to restoration, and will do much, in itself, to accomplish that end. But it sometimes happens that our soil is too poor to afford a catch of clover. In this case other hardier plants, such as buckwheat or rye, may be first used as a green manure, to supply humus, after which it is easier to get a catch of clover. It is well, on a poor farm, to have clover as frequently as possible until the land has somewhat recovered its fertility. Once every three or four years at least clover should be grown on every part of the farm, to give an abundant supply of nitrogen.

The mineral foods, potash and phosphoric acid, come from the soil. Every drop of water falling on and soaking into the earth has the power to dissolve some small portions of these substances out of their inert forms, and to carry it away. Particularly is this true of the warm rains of summer. If we can so arrange things that the water soaking into the earth shall go down into the soil empty, as it were, and come up again laden with some of the mineral food of the lower soil, and leave this food near the surface in such a form that it shall not be washed down again, we shall soon have the surface soil rich enough in these substances. Nature uses this method, and we must imitate it. Did you ever see the poor, barren hill-top from which the surface soil had been removed? Did you ever notice that same hill-top, a few years later, covered with vegetation, rich in plant-food? How did it come? In this way: A few hardy plants took root there, and grew where no others would, and these drew the fertility from the lower layers, and left it near the surface for the use of other plants that came later. The rain falling on the earth dissolves some of its plant food in the lower layers as well as at the surface. If the surface of the soil is bare of plants this tends rather to impoverish the surface soil than to enrich it. But where the soil is covered with plants the case is different. The water cannot dissolve the plant-food near the surface, as it is all held by the plants, hence it goes into the lower soil empty. There it dissolves a certain amount of mineral plant-food. Afterwards it is raised to the surface for the use of the plants there, carrying its plant-food with it. There the food is seized and held by the plants, so that it cannot be washed down into the earth again. In this way the mineral plant-food is concentrated near the surface. Hence in restoring the fertility of run-down soils we should use a rotation that will keep the soil covered with growing plants as continuously as possible.

Another cheap source of mineral plant-food is found in the wood-ashes produced on the farm. This source of fertility is too often overlooked, and it is too important to be so treated. A good ash-house should be a part of

every farm, a place built of cement, stone or brick, so as to be fire-proof, and with a good roof. Into this should be emptied all the ashes produced. They constitute a very valuable manure, and may be used to advantage either with roots, or on land seeded with clover. They should always be applied to the surface, not plowed under. The writer has got splendid results from ashes used in this way.

But not only must we get plant-food. We must keep it. The sale of bulky products, hay and grain, must be stopped, and in its place be substituted the sale of animal products. I do not think it possible to build up a run-down farm so long as we continue to sell grain and hay to any large extent. By feeding these to animals we keep, in the manure, nearly all the plant-food contained in the crop, and realize more money for the animal product than we would by selling the crop. Feed live-stock, produce manure, and then take care of it. Avoid heating and leaching, both serious sources of loss to manure. Manure is best saved by being either hauled direct to the land from the stable or stored in an open yard, free from running water or the eave droppings from barns, spread evenly and well tramped. An open yard is to be preferred, generally, to a manure shed, as in the shed the manure is apt to become too dry, and to fire-fang, losing much of its value.

These same methods that have been outlined as a means of restoring fertility serve also to restore humus. Wherever clover and barnyard manure are used the soil cannot long be poor in humus.

Good rotations are as follows:

(a) First year, clover; second, hoe crop; third, grain; seeded down the fourth year.

(b) First year, clover; second, grain, timothy, for hay or pasture; third, hoe crop and peas; fourth, grain (wheat and barley), seeded down.

These are good rotations, and it will be noted that they provide plenty of clover for nitrogen, plenty of hoed-crop to clean the land, and that in them the land is covered with a growing crop nearly all the time, thus, as was before pointed out, concentrating the mineral plant-food near the surface.

For cleaning the land we use two things—cultivation and the smothering effect of good crops. Cultivation, shallow at first, to sprout weed-seeds, should be given after harvest wherever practicable. Besides the hoed-crop, roots or corn, thoroughly cultivated, can be used advantageously to check and destroy many weeds, even our worst. For some particularly bad weeds, as sow thistle and quack-grass, a bare fallow is effective, but we do not recommend it, as it is too costly, and is wasteful of fertility. Then, as the land becomes richer we find we are less troubled by weeds. Weeds are always most troublesome on poor land, where the crop is weak. I know of no better general method for holding in check weeds of all kinds than to have our land in such condition that it will always grow a good, strong crop.

In regard to depth of plowing it is not wise on poor land to plow deep. A little fertility gives greater results if held near the surface than if scattered through a greater depth. At the same time a deep, rich soil is better than a shallow one, and we should aim, as our land becomes richer, to gradually deepen it till a good depth, say seven or eight inches, is reached.

We have tried to point out some of the methods to be used in restoring worn-out soil. Summing up, we would say: Use a rotation of crops that will have plenty of clover to gather nitrogen, and will keep the land as far as possible covered with growing plants to collect mineral foods, feed live-stock to get manure, and take care of it; take care of your ashes, and don't plow too deep at first. These methods, used intelligently, will restore fertility to a worn-out soil, and will do it not only cheaply, but with profit.



## SUGAR BEETS AND BEET SUGAR.

BY C. C. JAMES, DEPUTY MINISTER OF AGRICULTURE.

Beet sugar has been produced in Ontario during the past five years. There have been beet sugar campaigns in Ontario in former days, but the present began in the year 1889, when, at the request of the late Robert H. Lawden, seed was imported from Germany and distributed among farmers in Ontario. The plots were principally situated between Toronto and Whitby. The beets were shipped to the Ontario Agricultural College and tested in the chemical laboratory. The result of the tests by the College chemist, (C. C. James) and Mr. Wilfrid Skaife, manager of the Berthier (Quebec) Beet Sugar Factory, were published in a special report in 1890. The following extracts are taken from that report:

"One thing is certain from the results, viz., that if the beets can be grown of the quality of those produced here, at Mr. Whitfield's, at Mr. Lick's, and at Sir W. P. Howland's garden, they will produce sugar abundantly. The beets grown here are in shape, size, and sugar per cent. fully up to the standard as given by sugar beet authorities." (C. C. James.)

"I shall say finally that the above figures indicate, everything considered, that sugar beets of fine quality can be raised in Ontario, but that early sowing and careful cultivation are perhaps more important factors than in Europe, and that, under the circumstances, the percentage of sugar as above is remarkably high." (Wilfrid Skaife.)

The experiments were continued during 1900 and 1901, the area of experimentation being extended. The beets were sent to the Agricultural College and tested and reports of the results issued in the reports of the Chemist. Separate reports also were issued as follows:

Bulletin No. 113, "Sugar Beet Experiments in Ontario, in 1900," by Dr. A. E. Shuttleworth, Professor of Chemistry, Ontario Agricultural College.

Report of the Sugar Beet Investigation, 1900. In addition to reprinting Bulletin No. 113, this report contained reports of three delegates who were sent to Michigan to enquire into and report upon sugar beet growing in that State. Messrs. C. E. Lundy, D. C. Anderson, and G. C. Creelman.

Report of Sugar Beet Experiments in Ontario in 1901. During this year experiments were being carried on at fifteen centres, as follows: Alvinston, Belleville, Berlin, Cayuga, Clinton, Dunnville, Lindsay, London, Mount Forest, Peterboro, Port Perry, Simcoe, Walkerton, Waterford, Whitby. The report contained the Act to encourage the sugar beet industry passed April 15th, 1901, and gives the names of the four companies first organized to manufacture beet sugar at Wiarton (350 tons of beets daily), Wallaceburg (700 tons), Dresden (600 tons), and Berlin (600 tons). Mention was also made of the fact that in this year 4,800 acres of beets were grown in Ontario for Michigan factories producing upwards of 60,000 tons.

Report of the Sugar Beet Experiments in Ontario in 1902. (By Professor Robert Harcourt). In addition to the records of beets grown particulars were given of the new factories and illustrations of the buildings. There was also a new feature in the report on limestone in Ontario, accompanied by a geological map of the Province giving the distribution of the various limestones, which are required in the factory process.

The following is the Statute enacted in 1901:

## AN ACT RESPECTING THE ENCOURAGEMENT OF THE SUGAR BEET INDUSTRY.

*Assented to April, 1901.*

His Majesty by and with the advice and consent of the Legislative Assembly of the Province of Ontario enacts as follows:—

1. The sum of \$225,000 is hereby set apart as a special fund, to be paid out of the Consolidated Revenue of the Province, for the purpose of encouraging the growth of sugar beets, and the establishment of factories within the Province of Ontario for the manufacture of refined sugar therefrom.

2. In this Act the word "year" shall mean the twelve months from June 30th to July 1st of the succeeding year.

3. In case any person or company shall establish and erect in any part of this Province suitable buildings and instal the necessary plant for the manufacture of refined sugar from sugar beets grown within this Province, such person or company shall subject to the provisions of this Act, be entitled to be paid out of the said fund, for sugar so produced of first-class marketable quality, at the rate of one-half cent per pound for the product of the first and second year's operations of such factory, and at the rate of one-quarter cent per pound for the product of the third year, and nothing for any year thereafter.

4. Not more than \$75,000 shall be paid out of the said fund in any one year and in case the total amounts claimed as earned in any one year under the provisions of section 3 shall exceed \$75,000, the said sum of \$75,000 shall be divided among the applicants in proportion to the amounts of their respective claims under this Act

5. Every person or company intending to claim participation in the said fund shall file notice of such claim with the Treasurer of the Province on or before September 1st of the year in which claim is to be made, and the said person or company shall furnish to the Treasurer of the Province such proof of the correctness of the production and transactions of his or their factory as may at any time or from time to time be required.

6. Claims under this Act shall be payable only under and subject to and on proof of compliance with the following conditions:—

(a) That during the first year of the operations of such factory, the full sum of at least \$4 per ton shall have been paid for all beets delivered at the factory, under contract irrespective of the quantity of saccharine matter contained in such beets.

(b) That during the operations of the second and third years of such factory, the said person or company shall have paid for all beets grown according to contract and delivered at the factory at the rate of 33½ cents per ton for every one per cent. of sugar which such beets contain.

(c) All forms of contract for the growing and delivery of beets used or to be used by any person or company claiming aid under this Act must be submitted to the Minister of Agriculture and approved by him.

7. In the event of any dispute between any such person or company, and any contractor for the supply of sugar beets as to the quantity of saccharine matter which said beets contain, reference shall be made to the analyst of the Agricultural College, Guelph, or to such person as may be nominated for that purpose by the Lieutenant-Governor-in-Council whose report shall be final.

## AN ACT TO AMEND THE ACT RESPECTING THE ENCOURAGEMENT OF THE SUGAR BEET INDUSTRY.

*Assented to 26th April, 1904.*

His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. In addition to the special fund amounting to \$225,000 set apart under the Act passed in the 1st year of His Majesty's reign, chapter 11, the sum of \$150,000 is set apart and added to the said special fund and shall be paid out of the Consolidated Revenue Fund, for the purpose of encouraging the growth of sugar beets, and the establishing of factories within the Province of Ontario for the manufacture of refined sugar therefrom.



2. Section 3 of the said Act is amended by striking out all the words therein after the word "quality" in the seventh line and inserting in lieu thereof the words "annually during the first five years' operations of such factory, at the rate of one-half cent per pound, for the product of such factory."

3. Section 6 of the said Act is amended by striking out the words "second and third years" in the first and second lines of clause (b) of the said section and inserting in lieu thereof the words "second, third, fourth and fifth years."

From the above it will be seen that the five years of bounties provided for will be completed with the payment in 1907 on the basis of the sugar made from beets grown in 1906.

Based on the experiments conducted under the direction of the Minister of Agriculture, and encouraged by the bounties granted by the Ontario Legislature, the manufacture of sugar from beets has attained considerable proportions in this Province.

The first Ontario sugar campaign—which include the seasons of growing and manufacture—was that of 1902-3, with four factories making:

	Capital Stock	Amount Paid up	Tonnage of beets used
	\$	\$ c.	
Ontario Sugar Co. (Berlin).....	1,000,000	397,490 00	33,647
Dresden Sugar Co.....	600,000	600,000 00	25,000
Wallaceburg Sugar Co. ....	500,000	450,200 00	18,000
Warton Sugar Co. ....	500,000	266,164 26	19,000

The following table shows the quantity of sugar made by each factory while in operation, together with the bounties paid in each year:

Campaign	Factory	Output of Sugar	Bounty from Province
		Lbs.	\$
1902-3.....	Ontario Sugar Co.....	6,063,926	30,319 63
	Dresden Sugar Co.....	3,763,987	18,819 93
	Wallaceburg Sugar Co.....	3,606,604	18,033 02
	Warton Sugar Co. ....	1,565,000	7,825 00
	Total .....	14,999,517	74,997 58
1903-4.....	Ontario Sugar Co.....	7,059,695	35,298 47
	Dresden Sugar Co.....	2,094,999	10,474 99
	Wallaceburg Sugar Co.....	4,230,422	21,152 11
	Warton Sugar Co. ....	981,000	4,790 42
	Total .....	14,366,016	71,715 99
1904-5.....	Ontario Sugar Co.....	7,260,637	36,303 18
	Wallaceburg Sugar Co.....	7,574,708	37,873 54
	Warton Sugar Co. (Bal. from 1904) .....		14 83
	Total .....	14,835,345	74,191 55
1905-6.....	Ontario Sugar Co.....	9,510,753	34,315 32
	Wallaceburg Sugar Co.....	11,276,066	40,684 68
	Total .....	20,786,829	75,000 00
1906-7.....	Ontario Sugar Co., Berlin .....	10,341,907	
	Wallaceburg Sugar Co.....	10,721,107	
	Total .....	21,063,014	

During the summer of 1904 the Dresden factory was removed to the State of Michigan, and the Wiarton factory had to suspend business, owing to financial difficulties, leaving but two sugar factories operating in the Province. The Provincial bounties entered in the preceding tables as earned by the Wiarton Company in 1903-4 and 1904-5 were paid direct by the Government to the growers of the beets, and not to the company.

Following are the statistics of beets grown for sugar beet factories doing business in the Province in 1905:

Factory.	No. of Growers.	Acreage.	Tons.	Tons per acre.
Ontario Sugar Co. (Berlin).....	1,900	4,447	48,085	10.7
Wallaceburg Sugar Co.....	1,300	6,200	52,000	8.4

The tonnage of beets handled by the two factories in the campaign of 1905-6 exceeded the total tonnage of the four factories operated in 1902-3 by 4,438, while the total quantity of sugar made was nearly 6,000,000 pounds more than the product of any preceding year.

The percentage of sugar in the beets furnished to the Berlin sugar factory in 1904 and 1905 averaged about 15 per cent. On this basis the average yield of 10.7 tons per acre in 1905 would be worth about \$53.50 to the grower. The beets sent to the Wallaceburg factory in 1905 averaged 14 per cent. of sugar, and on this basis the average yield of 8.4 tons per acre would be worth to the grower about \$39.20 per acre.

The total area of 10,647 acres in 1905 would give an average of about three and one-third acres to each grower. The patrons of the Berlin factory were scattered over eighteen counties.

Before the establishing of sugar factories in Ontario a number of farmers in some of the border counties grew beets for Michigan companies. It is estimated that in 1905 about 20,000 tons of sugar beets were shipped to the United States by Canadian farmers.

Sugar beet pulp is much appreciated by growers of live stock in the Berlin district, and the demand for it has this year exceeded the supply at 50 cents a ton. In the Wallaceburg district, however, the case is different, and the bulk of the pulp is allowed to go to waste.

The thorough cultivation given to the beets, and the tendency of the plant to smother weeds by the spreading habit of its large leaves, put the land in splendid condition for succeeding crops. The main drawback to the raising of the crop is the scarcity of field labor.

## THE BUILDING UP OF THE AVERAGE DAIRY HERD FOR THE PRODUCTION OF MILK FOR THE FACTORY.

BY GEO. CARLAW, WARKWORTH.

There is no subject of more importance to the dairymen of our Province than the one above mentioned. In spite of the hundreds of good dairy cows in this Province, the average amount of milk produced is about 3,000 pounds per cow per year, and less than 150 pounds of butter per cow per year. It, therefore, follows that the owners of these average cows and all the cows



below the average, and many of them above the average, must be interested in the improvement of their dairy cattle.

There is no such thing as the dual or general purpose cow; that is to say, the dairy farmer cannot go out among the beef-breeds of cattle and select dairy cows, as well adapted to the cheap production of milk as if he confined himself to some of those breeds that are already noted for their results in this direction. A cow combining excellence in the production of both milk and beef will not have either of these qualities developed to such a high degree as a cow noted for either of these special lines. The qualities necessary to convert grass or other foods into a large flow of rich milk are not the same as those for converting it into good beef. Therefore, the farmer who is following some line of dairy husbandry must select sires to head his herd from those breeds that have for generations been bred to a high degree of excellence in the production of milk and butter.

The sire is said to be half of the herd, but I believe in a herd of poor grades he is very much more than half. By all means use a registered bull, but do not use him because he is registered, as some of them are registered which should not be. Get the pedigrees of several bulls before purchasing, and see what their sires and the dams of their sires have been producing, and be very particular to find out what kind of producers their own dams are; select the best. Buy the very best bred dairy bull you can find. Do not pay so much attention to his ancestors' prize winning at fairs, but to what they can do at the pail and churn. Look not so much to one or two sensational records they may have, but to a good, steady record from beginning to end of each year. Too much importance cannot be placed on the necessity of seeing the dam and knowing that she has a good, square udder, with quarters evenly divided and the teats well placed on each quarter. The teats should be about two and one-half to three inches in length, and of medium size, and be free from all obstructions inside. Prepotency in breeding is the power in an animal to transmit in a marked degree his or her good qualities and characteristics to his or her offspring.

Select the best cows in the herd by weighing each cow's milk after each milking; or, in other words, keep individual cow records and know what your cows are doing. If this is too much trouble select one day in each week, and weigh each cow's milk after milking, morning and evening, and keep the records in a book specially kept for the purpose, using a separate page for each cow. This is not so much trouble as it at first seems, and you will have the satisfaction of knowing at the end of the year which are your profitable and which the unprofitable cows. With very little calculation you can at the end of the year know what your cows are costing you; and without any trouble you can know how much it costs to produce milk; and when you find out the cows that are actually losing you money, sell them to the butchers. There is no use in trying to build up a herd from unprofitable cows, but keep the cows that are showing you a profit. After selecting our sire and cows in this way, we should raise the heifer calves from the best cows. In raising the calves we should guard against their becoming over fat, but I am afraid too many of them are not kept up in that nice, thrifty condition so desirable for the full development of every organ in the young cow. If they are not fully developed in the young, growing animal we can never develop them when the cow has reached maturity; and if kept too fat when young, the sensitive mammary glands become congested with fat, and they will never make that desirable, profitable dairy cow.

## THE COMMERCIAL PRODUCTION OF STRAWBERRIES, RASPBERRIES AND BLACKBERRIES.

By W. F. KYDD, SIMCOE.

In order to obtain the best results from the production of small fruits it is of the utmost importance to have the soil thoroughly cleaned by a hoe crop the previous year. The land should be well manured, preferably in the fall, before planting, and plowed under shallow. If manure must be put on in the spring it should be short, well rotted, and thoroughly mixed with the soil before planting. Wood ashes is a valuable fertilizer—fifty bushels per acre would not be too much. Scatter the ashes with a small shovel or sow by hand several days before planting; harrow sufficiently so that they may be thoroughly incorporated with the soil. The soil should neither be light sand nor heavy clay. The former is poor and hard to keep rich enough to produce profitable crops, while the latter is disagreeable to cultivate.

*Strawberries:* Plant as early in spring as plants of good size can be procured. There is nothing gained by planting very small plants. Better wait a week or ten days for good sized plants as small ones are more tedious to set and more of them die. If possible, harrow the land every other day for a week previous to planting. This will kill thousands of weeds just starting.

Strawberries are perfect or imperfect in their blossoms. As a rule the latter are the greatest producers, but must have a perfect flowering variety planted near in order that the bees or the wind may carry the pollen to the imperfect flower. I plant every fourth row a perfect variety, and have found that quite sufficient. Care must be taken in selecting varieties for fertilizing, that they blossom at the same date as those that are to be fertilized.

In digging plants the roots should not be exposed to the sun or wind, if a good stand is expected. Dig or prepare plants by putting in bunches. My method is to place several thousand plants in a wheelbarrow, all nicely sorted and roots straightened out, keep them covered with an old blanket, and have a watering can to sprinkle the plants as soon as they are put in the barrow. Plants treated in this way will keep in splendid condition for days.

After the plants are set in the ground, take a garden rake and level the ground all around the plants. The blossoms on young plants must be cut off, if left on, the strength of the plant will go to maturing fruit, instead of making strong plants for the next year's crop. Cultivate while the plants are small. The time to kill weeds is before they appear. The best tool is a horse harrow cultivator, the teeth being only half an inch wide enables one to work very near the plants, and a garden rake can be used between them.

There are different methods of marking the ground for the rows. I have tried several, but for years have used a line, as I can get the rows straighter that way than by any other method. The straighter the row, the easier the cultivation.

I plant according to variety from thirty eight to forty six inches between the rows, and in the row from eighteen to twenty two inches between the plants.

I use a spade with a strong back for making the holes, put it into the ground about six inches, push it backwards and forwards, and if possible do not have the ground with a "glazed" side because unless that glazed side is broken by the planter it will become hard, and the tiny roots cannot penetrate it. Always place the spade in the ground with its edge to the line. Great care must be taken in placing the plants in the earth, not deep enough



to have the crown of the plants covered, nor so shallow as to have a single root exposed.

As runners grow they should be placed between the plants otherwise there will be blanks. I often see in fruit journals "always cultivate one way" That is in order that the runners be not continually moved, but they must be kept cut by a cutter, only permitting the rows to grow the desired width; two feet is wide enough, unless the runners are cut the cultivator "warps" them together and plants are too thick to produce large berries. Hoe often during the summer, never permit weeds to start, watch grass, especially after it has started, as it is next to impossible to hoe it all out; the same land cannot grow weeds and a large crop of fruit.

In the fall as soon as the ground is frozen hard enough to bear a waggon, mulch plants with a coating of straw, taking care the straw is free from weed seeds, and more especially no timothy seed. In spring, after freezing and thawing weather is past, rake off the greater part of straw from plants, putting it between the rows; this keeps the berries cleaner, conserves moisture, and makes it easier for the pickers knees.

Pick when berries are dry, as early in the morning as dew has gone. I have found that berries picked in the hottest part of the day do not ship as well as those picked morning and evening. Some pickers handle fruit as if fingers had never touched it, others have it looking "mussy." The berries should be stripped off the vine between the fingers not pulled by finger and thumb. The latter method bruises and juice runs out of the fruit. Put the berries on the market in a neat, clean package and never "face" with big fruit.

I have not mentioned any particular variety because the kinds that do best here might not be suitable for the locality where the reader of this article resides. Keep varieties that produce well where you live. In buying new kinds, the ones largely advertised, something "boomed," go slow. Try a dozen and those might be twelve too many. Years ago I bought about one dozen of nearly every new kind I saw advertised as "the best yet," with but one exception my money was thrown away. Such plants cost \$2 per dozen.

*Raspberries:* There are two ways of growing the raspberry, planting so cultivation can be done both ways as corn in hills, or cultivating only one way. I tried the former method, but only once; had them in 5 feet x 5 feet but the bush went everywhere; so a horse could do no work without injuring the canes. I plant in rows, seven feet apart and three feet between plants. In Cuthbert, Marlborough, or other such small bushes, one could have the rows closer. A ploughed furrow can be made, plants placed in it, and these covered with a hoe. This is a rapid manner of planting. In the fall or winter, all old wood should be cut or broken off, the new canes or bearing wood must be shortened to about four feet, or a little less. I have done that both fall and spring, sometimes when done in the fall the canes die back, many inches, so I think spring is the better time to shorten canes. The ideal method is to pinch out terminal buds of canes, that is the young shoot, when it is about eighteen inches or two feet from the ground, the cane would then branch and make a much stronger and more stocky bush, but in large quantities that method is hardly practicable.

*Blackberries:* I have found very profitable. Many varieties are very tender and care should be taken in ordering a kind that will not winter-kill. Plant them a little further apart than raspberries so the pickers may have plenty of room to work, as they have so many thorns. The rows cannot be close, about nine feet apart is close enough. Prune same as raspberries only a little closer.

## THE DANGER TO ONTARIO FARMERS FROM THE INTRODUCTION AND SPREAD OF NOXIOUS WEEDS.

By W. S. FRASER, BRADFORD.

The danger to farmers from having new weeds introduced on their farms and the spread of those that have already made their appearance is not felt to the extent that the situation demands. This is perhaps owing to the fact that they do not realize the effect that weeds have, both on the appearance and productiveness of farms.

Weeds are a serious hindrance to successful farming. They occupy space, and as they are vigorous feeders, use up plant food and deplete the land to no useful purpose. They also draw largely on soil moisture, the lack of which in our land lessens the power of crops to make use of plant food in the soil. It is said that a ton of weeds (dry matter) requires from ten to twenty tons of moisture to produce it. It was once thought that weeds grew spontaneously; but it is well known now that they are the product of seeds which have been planted in the soil. Weeds, as a rule, reproduce themselves abundantly, and their seeds are possessed of great vitality. Many of them, after lying dormant in the ground for years, grow when brought to the surface.

They are despised plants, and because they have always had to struggle for an existence each one is possessed of some strong feature which enables it to thrive and reproduce itself under adverse circumstances; hence the saying, "Grow like a weed," and "Hardy as a weed." We are told that nearly all our weeds have been imported and have been distributed from place to place. Some have wings and are carried by the wind—the thistle family, for instance; some have hooks, such as burrs and ragweed, etc., which attach themselves to animals and clothing. Threshing machines, too, carry them from farm to farm, and railways are great mediums through which they are carried from one district to another.

The investigation that has been carried on under the Department of Agriculture at Ottawa, for the past few years has been a revelation to many. Samples of red clover have been found to contain 40,000 weed seeds per pound, alsike clover 49,000, and timothy 50,000, and as many as sixteen different varieties.

The question of dealing with weeds is one that is pressing itself upon all farmers who have any regard for the appearance or prosperity of their farms. Much more care should be exercised by farmers in the selection of their seed, particularly of clover and grass seeds. Weeds obtained in this way have better chances of growing than those brought to our farms in other ways, as they are sown in land that is well prepared for their growth. The investigation before mentioned has also shown that much of the clover and other grass seed sold to farmers is low in vitality, and this fact, together with the number of weed seeds it contains increases the cost of the genuine seed in some cases 100 per cent., showing clearly that low grade seed is most expensive.

Another source from which we are in danger is the mill feed which we buy. This often contains a very high percentage of weeds. At a meeting of Grain Commissioners, held in Toronto, last September, samples of grain and other mill feeds were shown containing weed seeds that were not crushed and that would in all probability grow.

It was also shown at the same sitting of Commissioners that a large trade is being done in bringing screenings from the elevators in Port Arthur



and Fort William to Eastern Ontario, where they are re-ground, mixed with barley or corn, and sold under other names. Persons engaged in this trade state that weed seeds have great feed value. Prof. Graham, O.A.C., had a test made of their value in feeding chickens. He says that had he continued the use of the mixture another week, he believes the chickens would have died. And yet these feeds are brought here and sold to farmers for feed, and they are not only disappointing as food, but may bring some of the worst weeds on the continent to the farms.

Weeds are classified as annuals, biennials, and perennials. Annuals complete the cycle of their existence in one season, as mustard, ragweed, and wild oats. Spraying with sulphate of copper is an effective way of dealing with mustard when plants are well up and where it is thick. After-harvest cultivation is a good way of dealing with ragweed and wild oats. Winter annuals are plants which require a longer season than we have to develop them. Their seed usually germinates after midsummer. They endure the winter, and early the following season produce their seed. Prominent among these are false flax and pigeon weed, flourishing mostly in fall wheat and clover. The remedy is to avoid sowing fall grain so far as possible, as spring and fall cultivation destroys them.

Biennials are plants which require two seasons to develop. The first year they develop their root system, the second they produce their seed. Burdock and wild carrot are examples, and are not hard to deal with in cultivated land. By cutting them two inches below the crown they will be destroyed. Cutting above the ground has very little effect, and digging out the root is quite unnecessary. These, like annuals, are only propagated from seed.

Perennials are plants which continue to live on year after year. Simple perennials, such as ox-eye daisy, do not propagate from their roots, but creeping perennials, such as Canada thistle, sow-thistle, and bind weed, reproduce from their roots, as well as from their seed. This class of weeds are the most difficult to eradicate. Thorough cultivation, keeping them cut off for one season and not allowing them to develop deep growth will exhaust the root.

We need to study the nature of weeds and their habits of growth. When a weed appears which is new to us and which we are unable to botanize, we should send a specimen to the O.A.C., Guelph, where it will be identified, and its name, characteristics, and methods of eradication will be sent us by return mail. This will save us much trouble, for the saying that "One year's seeding is nine years' weeding" is too true.

Farmers should pay very particular attention to the cleaning of their seed grain. After purchasing grass seed, we may examine it by spreading it on a sheet of white paper and ascertain what proportion of it is foreign; or if we send a sample to the Seed Department, Ottawa, they will tell us the number of weed seeds it contains per pound.

We cannot afford to neglect any effort to prevent new weed seeds getting a hold on our farms. A bill, introduced by the Hon. Sydney Fisher, has become law, which regulates the sale of seed. This requires that all seed sold be graded and labelled, No. 1, No. 2, or screenings, and that when seed is of a lower grade than labelled the vendor is liable for damages.

## THE CANNING INDUSTRY OF ONTARIO.

BY T. B. RIVETT, B.S.A., TORONTO.

The industry of canning and preserving of vegetables and fruit, which to-day has reached immense proportions, and has been attracting a great deal of attention as an investment, but more particularly as the commodity in which a Canadian company practically has the monopoly, was started twenty-six years ago by Mr. Warrington Bolter, at Picton in the county of Prince Edward. Mr. Gilbert Barker also started one at Bloomfield in the same year.

At that time machinery and appliances were very inadequate. The canned product had to be introduced and the prejudice of the consumer overcome. With the advent of new machinery, which practically did away with an immense amount of hand labor, and resulted in an improvement in methods, enabling the manufacturer to produce a cleaner and cheaper article, the development of the trade has been most marked, while the consumption has practically become almost universal. Factories have sprung up throughout the whole of Ontario, and are still continuing to be built to such an extent that it would almost seem that production will soon be in excess of demand.

In order to give an idea of the growth of this industry in Ontario, I will give the development of it in Prince Edward, the county in which it was first started, and which is famous for its canned product. About 1881, Warrington Bolter started his factory at Picton, and he was soon followed by Gilbert Barker, who erected a plant in Bloomfield. These men evidently were successful, for in 1884 Mr. A. C. Miller erected a larger up-to-date plant at Picton, which is said to be one of the biggest and best equipped in the Province to-day.

In 1889 Mr. A. B. Saylor bought the Barker factory at Bloomfield. In 1889 Thomas Owens and J. Barringer started the Quaker factory at Bloomfield. In 1902 J. W. Windsor and T. K. Shourds erected and operated a factory in Wellington. In 1903 Innes Baker started the Old Homestead factory at Picton. In 1904 the farmers of the county realized the probable profitable investment there was to be made in the industry and a company was promoted and operated by Mr. Manton, in which the farmers are the sole stock-holders. This factory is the first successful attempt in this line. In 1904, South Bay Canning Co., started. In 1905 the Lakeside factory was started at Wellington, and was operated by the Bloomfield Canning Co. In 1906 Mr. Bolter started to operate his factory at Demorestville, which he had abandoned. This year the farmers started a factory at South Bay, and the Bloomfield Canning Co., one at Hillier.

There is also the Potter factory four miles south of Belleville, which packs tomatoes, corn and asparagus.

It will be seen that the growth of the canning industry has been rapid in Prince Edward county. In twenty-six years the number of factories has increased from one to twelve. The factories are all up-to-date and substantial. They have bettered the condition of the farmers throughout practically the whole county. They provide labor during the summer and fall months to every available man, woman and child in the county. In fact the county cannot supply enough hands, and the scarcity of them has become a great problem. The amount of farm land utilized by the industry has grown from almost nothing to over 18,000 acres devoted to beans, corn, peas and tomatoes. A large acreage is also devoted to the production of small fruits, apples, pears, peaches, etc., for canning purposes.



It may be easily seen that this once insignificant industry, started twenty-six years ago, has grown tremendously, not only in Prince Edward, but throughout the whole Province of Ontario, for there are now sixty-four factories, which pay the farmers, in round figures, \$800,000.00, and give employment to 6,758 people, as well as the splendid investment it has proven to be.

#### THE CANADIAN CANNERS, LTD.

In April, 1903, there was a movement among some of the capitalists interested in the canning industry to combine a number of the different factories under one management. This amalgamation was carried out on April 4th, 1904. They bought out some thirty-five factories located throughout Ontario, and comprising in their pack all the different fruits and vegetables, and in some cases meats and poultry. Mr. Innes was first president, Mr. Marshall was general manager, and the head offices were located in Hamilton.

Of late a great deal has been said about the Canadian Canners, Ltd. The fact that it practically controls the market, is enough to attract the attention of the consumer, and producer. With its 30 factories in operation and situated as they are throughout eastern, western and southern Ontario, it is able to supply all customers any canned commodity. With its magnitude it is able to buy cans, boxes, sugar and other such commodities at a lower figure, and to get better rates for transportation. With its tremendous pack it is able to control, or at least, this is the current opinion, 90 per cent. of the wholesale houses in the Dominion under very strict intrinsics, which render it a losing proposition should any wholesalers attempt to handle products of other concerns. In fact so strong is their hold on the problem of distribution that the independent factories in quoting their prices to the few wholesalers and brokers who may handle their goods, always quote 5c. less per dozen than the canners opening price, together with the commission on the sales. With these prevailing conditions it is obvious that the stronger the Canadian Canners get, the greater will their influence be in restricting competition and distribution.

On the other hand the independent factories must realize the fact that the Canadian Canners fix the price of goods for the season, and thus they themselves have a solid foundation to work on, a selling basis which does away to a great extent with the cutting of prices, and underselling of products.

Then again the Canadian Canners, Ltd., have to support a high salaried staff at their head office, together with a manager at every branch of the factories, while the independent factories are in most cases managed by the proprietors, or by men who do not receive such salaries. Their cost of production should be less, provided they have bought their essentials at a proportionately good figure as the Canadian Canners, Ltd.

Whatever the effect of this concern may be on the problem of distribution and competition, their effect on the price of farm products will be practically nothing—for in all the sections in which canning factories are situated, the farmers can fall back on other branches of agriculture, and in a way compel the factories to pay the prices asked. By this method the farmer may utilize his acreage, but the loss to a factory to remain idle would be tremendous. This, of course, only holds true with vegetables, while on the other hand fruits will be continued to be grown successfully in spite of the attitude of factories, as the commercial market for all fruits is rapidly increasing. In this way the factory prices are kept buoyant and the com-

petition between market and factory may be looked upon as permanent, as the demand for both canned and ripe fruit is rapidly increasing.

Two or three years ago the tomato growers of St. Catharines demanded 30c. per bushel for tomatoes, and refused to grow any unless under such a contract. Some of them obtained their price, while others continued to grow at the same rate, 25c. per bushel. The result of the failure to obtain the rate of 30c. through that district can be easily explained and understood. The farmers as a body will not unite and stay in unison to obtain a common good—as a body they are most unwieldy, and do not seem to be able to grasp the strength of their power, which is almost unlimited. Their failure, if it may be called such, was due to lack of unity and co-operation.

*Prices.* Four years ago about the time of the consolidation of the Canadian Cannerys, the price of tomatoes was raised from 20 to 25c. per bushel. Within this period corn has increased from \$5. to \$7.50 and even \$8. per ton.

Peas used to be \$20 per ton in pod the farmer having to harvest by hand, to-day the price is \$25 to \$30 per ton shelled; the farmer having only to bring the peas in the straw to factory, where it is thrashed and weighed.

The price of fruit has varied a great deal, and this fluctuation is due principally to the demand of the local markets. Whether the Canadian Cannerys had anything to do in the raising of prices is questionable, but the fact remains that at about the time of the consolidation there was a general increase.

A few remarks have been made previously regarding prices, but as this is the greatest factor to the farmer it is necessary to deal with it more fully. For the last three years the farmers have felt that they have not received a high enough price for the products, especially for tomatoes. The price which the farmers have been and are receiving for this product is 25c. per bushel. Two years ago the growers around St. Catharines asked for an increase of 5c. per bushel. This was refused except by one independent company, and as a result a good many of the farmers refused to grow tomatoes for 25c. thinking that the factories would be compelled to pay what was demanded. However the factories shipped tomatoes into St. Catharines by the carload from districts where the farmer was not organized, and was willing to grow his crop for 25c. per bushel. This attempt to raise the price practically failed, and now the old rate is established. When the factories were asked to raise their contract price from 25 to 30c. per bushel, they simply refused and said it was not worth it, and they could not see their way to pay any higher—on the other hand the farmer thought that 30c. was a fair and legitimate price.

Throughout the canning sections of Ontario the crop of tomatoes varies from 75 to 500 bushels per acre, the yield being greatly influenced by the season, a factor which no one can eliminate. By care and management, this, of course, may be controlled to a great extent, but in any case the farmer takes all the risks, and even when he grows his tomatoes, the factory has the right to object to any which do not seem perfect.

Taking 75 as the minimum and 500 as the maximum (not exceptional) yield we would have an average yield of probably 275 bushels to the acre. This at 25c. per bushel is equivalent to \$68.75 per acre. Then deduct 25 per cent. as cost of production, which is \$17.18, allow \$10.00 for rent of land and we have approximately \$41.57 per acre net profit for the farmer. This estimate does not allow for risks of frost which are very great, for the late frost affect the tender plants and the early frosts the bearing vines, and stop ripening of fruit.

In my opinion the farmer does not receive a fair remuneration for his labor, pains and risks when he is compelled to grow tomatoes for 25c. a



bushel. If he could grow 400 bushels to the acre then 25c. would seem to allow a fair profit, but in very few cases is this average maintained, and even where it is, it is only under very favorable conditions. Should the factories, however, raise the price per bushel, I believe that in a great many cases it would be a profitable investment on their part, especially if the increase was in proportion to the quality of the fruit delivered at the factory. For at the present time the farmers' primary object is to grow bulk of crop not quality and smoothness of same, and it seems quite feasible that if the 30c. was paid for the best grade of fruit and 25c. for other grades that there would be a general tendency on the part of the farmer to improve his methods and attempt to grow a greater percentage of the better produce.

Whether or not the factories will consent to pay such figures is impossible to predict, but should the growers of canned products throughout the Province organize to get such raises in prices; there is no hesitation in predicting that they would succeed, if only they stood together for their common interests throughout the whole of Ontario. But it is practically no use for any one section trying to fight if tomatoes are grown a few miles away, and are available to be shipped to the place of scarcity, thus enabling the factory to continue its operations.

*List of average wholesale prices for the past four years and 1907:*

*Vegetables.*

	1903-06.	1907.
Tomatoes .....	25c. per bushel.	25c. per bushel.
Peas .....	\$25. to \$30. per ton.	\$25 to \$30 per ton.
Corn .....	\$5. to \$7.50 per ton.	\$7 to \$8 per ton.
Beans .....	\$25 to \$30 per ton.	\$25 to \$30 per ton.
Pumpkins .....	\$2. to \$2.50 per ton.	\$2.50 to \$6.00 per ton.
Asparagus .....	7c to 10c per lb.	11c per lb.
Rhubarb .....	\$5 to \$6 per ton.	\$8 per ton.

*Fruits.*

Apples .....	25 to 40c. per cwt.	50c to 60c per cwt.
Pears .....	1 to 2c. per lb.	1½c. to 2½c. per lb.
Peaches .....	25 to 35c. per basket.	
Plums .....	20c. per basket.	30c. to 40c. per basket.
Gooseberries .....	50c. per basket.	3c. to 5c. per quart.
Raspberries .....	5 — 6c. per quart.	8c. to 9c. per quart.
Blackberries .....	6 — 6c. per quart.	7c. to 12c. per quart.
Strawberries .....	4 — 5c. per quart.	5c to 8c. per quart.

Varieties: The question of varieties is one of very great importance, both to the grower and canner. The canners ideal variety of any product is one that has firmness, evenness, and the smallest percentage of waste material possible, while the farmers ideal is productiveness and earliness of maturity.

In Ontario where the season is comparatively short, and the early frost damages the produce for factories, earliness should be the predominant feature of any variety, and the basis of selection.

There are but few experiments carried on by the growers, and still fewer by the factories. The farmers are only required to grow what varieties are recommended to them by the managers of the factories and, as a general thing, the seed is also supplied by them.

## STATISTICS OF FACTORIES BY DISTRICTS.

The following table shows the varieties grown in the different districts, the amount of produce consumed, etc.

## VEGETABLES.

## EASTERN ONTARIO, EXCLUSIVE OF PRINCE EDWARD COUNTY.

		Value.
Beans, 52 acres, 144½ tons, .....	\$25.50 per ton	\$3,670 00
Varieties—Refugee, Goldenwax.		
Corn, 1,500 acres, 4,050 tons, .....	\$6.59 per ton	26,725 00
Varieties—Peck's Improved, Crosby, Excelsior.		
Peas, 400 acres, 675 tons, .....	\$27.22 per ton	18,375 00
Pumpkins, 80 tons, .....	\$2.50 per ton	200 00
Tomatoes, 1,005 acres, 219,750 bushels, .....	.25.1 cents per bushel	55,186 00
Varieties—Clarke, Early Jewel, Quaker Queen, Earliana, Early Michigan, Ignotum, Stone, Livingstone.		
Total.....		\$104,156 00

## PRINCE EDWARD COUNTY.

Beans, 109 acres, 233 tons, .....	\$32.15 per ton	7,490 00
Varieties—Golden Wax, Refugee.		
Corn, 3,137 acres, 8,330 tons, .....	\$7.00 per ton	65,440 00
Varieties—Early Crosby, County Gentleman, Early Evergreen.		
Peas, 1,320 acres, 2,295 tons, .....	\$31.89 per ton	71,350 00
Varieties—Alaska, Advancer, Market Gardener.		
Tomatoes, 1,334 acres, 311,000 bushels, .....	.25 cents per bushel	77,750 00
Varieties—Nore's King of the Early, I.X.L., Worden, Livingstone's Globe, Henderson's Freeman, Bruce's Niagara.		
Total.....		\$222,030 00

## SOUTHERN ONTARIO.

Beans, 189 acres, 281 tons, .....	\$24.00 per ton	6,750 00
Varieties—Golden Wax, Refugee.		
Corn, 3,400 acres, 6,620 tons, .....	\$6.59 per ton	43,662 00
Varieties—Stowell's Evergreen, Excelsior, Early Crosby, Hiccox.		
Peas, 1,462 acres, 1,974 tons, .....	\$22.35 per ton	44,270 00
Varieties—Glory, Alfa, Market Gardener, Advance.		
Pumpkins, 490 tons, .....	\$2.98 per ton	1,425 00
Tomatoes, 2,877 acres, 677,900 bushels, .....	.23.3 cents per bushel	171,425 00
Varieties—Earliana, Success, Favorite, Ignotum, Matchless, Early Michigan, Marvel Paragon, Royal Red, Earliest of All, Greater Baltimore, Perfection, Stone.		
Total .....		\$267,532 00

## WESTERN ONTARIO.

Beans, 7 acres, 10 tons, .....	\$25.00 per ton	250 00
Varieties—Golden Wax, Refugee.		
Corn, 670 acres, 1,400 bushels, .....	\$6.39 per ton	8,950 00
Varieties—Early Crosby, Early Evergreen, Stowell's Evergreen.		
Peas, 260 acres, 275 tons, .....	\$25.00 per ton	6,875 00
Varieties—Alaska, Advance, Market Gardener.		
Pumpkins, 85 tons, .....	\$2.50 per ton	202 50
Tomatoes, 420 acres, 88,500 bushels, .....	.25 cents per bushel	22,135 00
Varieties—Early Michigan, Ignotum, Earliana, Stone, Livingstone.		
Total .....		\$38,412 50



## FRUIT.

## EASTERN ONTARIO, EXCLUSIVE OF PRINCE EDWARD COUNTY.

Apples, 1,500 bushels, ..... (All winter varieties.)	22 cents per bushel	325 00
Peaches, 3,000 baskets, ..... Imported from Niagara District, Yellow Fleshed varieties.	25 cents per basket	750 00
Pears, 500 bushels, ..... Varieties—Bartlett, Clapps.	50 cents per bushel	250 00
Plums, 2,000 baskets, ..... Varieties—Lombard, Green Gage, Dawson.	20 cents per basket	400 00
Raspberries, 90,000 quarts, ..... Varieties—Cuthbert.	6½ cents per quart	5,625 00
Strawberries, 74,000 quarts, ..... Varieties—Wilson, Williams, Albany.	5 cents per quart	3,700 00
Total .....		\$11,050 00

## PRINCE EDWARD.

Apples, 7,500 bushels, ..... (All winter varieties used.)	40 cents per bushel	3,000 00
Raspberries, 112,000 quarts, ..... Varieties—Cuthbert, Columbia, Shaffer's.	5 cents per quart	5,600 00
Strawberries, 200,500 quarts, ..... Varieties—Wilson, Williams.	.5c per quart	10,025 00
Total .....		\$18,625 00

## SOUTHERN ONTARIO.

Apples, 80,200 bushels, ..... (All varieties used.)	25¾ cents per bushel	20,640 00
Blackberries, 38,000 quarts .....	.6 cents per quart	2,280 00
Gooseberries, 16,050 quarts, ..... Varieties—Downing, Pearl.	4½ cents per quart	782 50
Peaches, 149,100 baskets, ..... Varieties—Old Nixon, Crawford, Mountain Rose, Elberts, Early St. John, Fitzgerald, Smock.	28½ cents per basket	41,880 00
Pears, 30,000 baskets, ..... Varieties—Bartlett, Kieffer, Flemish Beauty.	28½ cents per basket	8,600 00
Plums, 21,300 baskets, ..... Varieties—Claude, Niagara, Lombards, Yellow Egg.	20¾ cents per basket	4,410 00
Raspberries, 534,000 boxes, ..... Varieties—Cuthbert, Marlborough, Columbia, Shaffer and Wild Fruit.	6½ cents per box	35,045 00
Strawberries, 652,500 boxes, ..... Varieties—Wilson, Williams, Brandywine.	4½ cents per box	31,480 00
Total .....		\$125,057 50

## WESTERN ONTARIO.

Apples, 16,500 bushels, ..... (All winter varieties used.)	25½ cents per bushel	4,275 00
Blackberries, 3,220 quarts, ..... Varieties—Snyder.	.6 cents per quart	193 20
Gooseberries, 1,320 quarts, ..... Varieties—Downing.	.5 cents per quart	66 00
Pears, 1,000 bushels, ..... Varieties—Bartlett, Keiffer.	40 cents per bushel	400 00
Strawberries, 1,400 quarts, ..... Varieties—Wilson, Williams, Albany.	.5 cents per quart	700 00
Total .....		\$5,634 20

## INDEPENDENT FACTORIES.

Independent factories are those that are not associated with consolidated canners. There are thirty-four of these distributed throughout the province, and the number is gradually on the increase.

These factories pay the farmer the same price as the Canadian Canners, except in a few cases in Prince Edward County, where owing to the large number of factories in the same territory, the competition has been keener and prices in some cases high.

Independent factories may be divided into three separate classes:—

*No. 1—Independent.* Those factories not in the consolidation and which do not receive any bonus from any municipality or county.

*No. 2—Subsidized Independent.* Those factories which are independent, but which are bonused by a municipality or public corporation.

*No. 3—Farmers' Factory.* Those factories which receive or do not receive any bonus, but the stock of same is owned and controlled by the farmers in the district.

The independent factories of Ontario are doing a good business, amongst their number we find some of the best equipped and cleanest of factories, and some of their brands are pre-eminent. They greatly out-number the others of this class. One of the independents, the Oshawa Cannig Co., is a concern which seems to have solved the problem of distributions. The promoter of this company, in order to get the necessary capital, sold the stock amongst the smaller grocers in Ontario. I understand that the stock is thoroughly distributed in the different sections. By this move it would seem evident that all the shareholders, except those who are completely in the hands of the wholesalers, would carry and push this company's goods in the mere preservation of their own interests, and so long as the pack of the Oshawa Canning Co., is good, competition in the district of the shareholder will be much handicapped.

*The Subsidized Independents.* There is only one factory of this class in Ontario, which is situated at Essex, and known as the Essex Canning Co., This Company received a bonus of \$5,000.00 to erect and operate a canning factory in the town of Essex for 5 years. This would appear an excellent way for adding industry to a community.

*Farmers' Canning Factory.* As previously explained. the stock of these factories is held and controlled by the farmer. Here the farmer not only gets the sale value of his produce, but he receives the interest on his investment. These conditions should stimulate every farmer to be more thorough in his cultural methods, and choice of varieties, and in the production of a higher grade of produce, which would lessen the waste at the factory, increase quality of pack and add prominence to the brands. This method of distributing the capital stock of canneries throughout the farming community, thus interesting and stimulating the farmers to be more interested in its welfare, seems a very admirable one, and one to be encouraged. This probability in the case of the farmers has two incentives:—

(1) Opening of new and productive channels for his operations on the farm.

(2) The inducement to invest in a sound proposition with the probability of receiving from 10-20 per cent. for his money.

With these two points it seems a rather easy undertaking to induce farmers who have some money to take up the proposition and invest. But the question of distributions and over-production must be looked into. One has indeed overcome the greater part of the problem of production, but his



greater task of establishing his brand, and overcoming the problem of distribution still remains. He has also to face the question of demand and supply, and if having satisfied oneself as to favorable relation of these two facts. The farmer cannot invest his money in a more profitable way, and one which has such desired beneficial bearing on himself and his community at large, than in the Canning industry.

Should these factories increase throughout Ontario to any extent and consolidation take place, the position would carry extreme power.

The first of these factories was started at Leamington, and ran for one season, when the farmers were so disgusted with their mismanagement that they sold out below par, and Mr. McGregor bought in the stock and entered the consolidated canners. Here again their failure was due to lack of unity and co-operation. Every shareholder thought that because he had his money invested, all his goods, bad or good, had to be taken. The result was a bad pack and general demoralization of the whole affair. The failure of this attempt was a great misfortune, for situated in such a locality the farmers should have been able to grow the best of vegetables, and have established an excellent brand.

The next attempt was made in Bloomfield, Prince Edward county, in 1904 and is known as the Farmers' Canning Co. From the start this venture has been a success, and this may chiefly be attributed to the fact that it was started in a locality where the canning industry had been established for some time, and the farmers had a greater conception of the business of growing produce for the factory, than the farmers of Leamington. A great deal of the success is also due to Mr. Manton, the promoter and manager of the concern, who has satisfied the growers and stock-holders, and is building up a better business every year.

The third attempt was started this year at South Bay. The farmers of that district have formed a company with a capital of \$40,000 and are building an up-to-date factory, where they hope to can small fruits and vegetables next year. This year they will only be able to put up tomatoes.

#### *Contracts.*

In order to get some adequate opinion of the amount of acreage that a canning concern has under its control for the coming season, and also to have some hold on the producers, every factory contracts under written agreement with farmers in its immediate neighborhood, to grow so many bushels, tons, or acres of any commodity. Their contracting is not done promiscuously, i.e., making agreements with any farmer to grow a large acreage, but the record of every producer is kept, his average yield of the different crops is deducted and the manager-acting on this data together with his own judgment allots to such a producer, approximately, what he considers him to be able to produce.

There are several different types of contracts, but in every case they are drawn up wholly for the benefit of the factory. In the question of production where the quantities in a contract is enumerated in acres, we find the yield is limited per acre. On the other hand some contracts call for so many bushels omitting any acreage. So in a case of over-production of crops the factories have it in their power to limit the production of canned produce, providing their estimate in the contract was in any way correct.

In cases of short crops, some contracts even go so far as to specify that should any growers have a larger acreage or quantity than what was called for in the contract, and should the factory need the excess, he must sell to the factory at contract price or pay 25 per cent. of liquidated damages. In any case these canning factory contracts are well matured contrivances to

legally protect their issuers in every way. While their only apparent value to the farmer is to assure him that he may sell so much produce, subject to the inspection and regulation of the factory. But although these contracts are legally and theoretically correct, yet their whole value lies in the amount of moral jurisdiction it will have over the producer, for should a factory prosecute a contractor for breach of contract, and get judgment against them and finally collect a fine, their popularity and good faith would immediately decrease, and in this way they would lose their producers. So the value of a contract to a factory, outside of such technical points as conditions and amount of produce, depends wholly on the moral effect such an agreement may have on the contractor, who in this case is the farmer, for should the management of a factory prosecute all infringements of their contracts, they would soon have to grow their own produce, as the farmer seems always to be ready to co-operate and concentrate their energies in self-protection, especially when the courts have been used as a means of arousing them.

### CANNING FACTORIES OF ONTARIO.

#### EASTERN ONTARIO, EXCLUSIVE OF PRINCE EDWARD COUNTY.

##### *Consolidated.*

Brighton Canning Co .....	Brighton.
Kent Canning Co.....	Brighton.
Lakeport Preserving Co .....	Lakeport.
Miller & Co .....	Trenton.
Port Hope Canning Co .....	Port Hope.

##### *Independent.*

Belleville Canning Co .....	Belleville.
The Napanee Canning Co.....	Napanee.
Oshawa Canning Co.....	Oshawa.

#### PRINCE EDWARD COUNTY.

##### *Consolidated.*

W. Boulter & Sons .....	Picton.
A. C. Miller & Co.....	Picton.
A. B. Saylor Canning Co .....	Bloomfield.

##### *Independent.*

Bloomfield Canning Co.....	Hilker.
Bloomfield Packing Co .....	Bloomfield.
Farmers' Canning Co.....	Bloomfield.
Lakeside Canning Co.....	Wellington.
Port Milford Canning Co .....	South Bay.
Potter's Canning Co.....	Belleville.
South Bay Canning Co .....	South Bay.
The Old Homestead.....	Picton.
Wellington Packing Co.....	Wellington.

#### WESTERN ONTARIO.

##### *Consolidated.*

Canadian Cannery's Consolidated Co .....	Strathroy.
Strathroy Canning Co .....	Strathroy.
West Lorne Canning Co.....	West Lorne;



*Independent.*

Lytle, T. A. & Co .....	Toronto.
Meaford Canning Co .....	Meaford.
Rock Maple Pickle Factory .....	Guelph.
Williams & Sons .....	Toronto.

## SOUTHERN ONTARIO.

*Consolidated.*

Aylmer Canning Co .....	Aylmer.
Aylmer Canning Co .....	Hamilton.
Bowlby Bros .....	Waterford.
Delhi Canning Co .....	Delhi.
Delhi Canning Co .....	Niagara-on-the-Lake.
Dunnville Canning Co .....	Dunnville.
Grimsby Canning Co .....	Grimsby.
Imperial Canning Co .....	Kingsville.
Kent Canning Co .....	Sandwich.
Kent Canning Co .....	Chatham.
Lalor, F. R., Canning Co .....	Dunnville.
Leamington .....	Leamington.
Lowrey Bros .....	St. David's.
Ontario Pure Food Co .....	St. Catharines.
Strathroy Canning Co .....	Dresden.
Simcoe Canning Co .....	Hamilton.
Simcoe Canning Co .....	Simcoe.
Simcoe Canning Co .....	St. Catharines.
Schenck, L. M. & Co .....	St. Catharines.

*Independent.*

Alvinston Canning Co .....	Alvinston.
Black's Canning Co .....	St. David.
Burlington Canning Co .....	Burlington.
Canada Preserving Co .....	Hamilton.
Essex Canning Co .....	Essex.
Flynn Bros. Canning Co .....	St. Catharines.
Goodwillie, Jno. ....	Welland.
Heintz (pickles) .....	Burlington.
St. Thomas Canning Co .....	St. Thomas.
Standard Canning Co .....	Hamilton.
Smith, E. D .....	Winona.
Smith, E. D .....	Beamsville.
Tecumseh Canning Co .....	Tecumseh.
Thames Canning Co .....	Thamesville.
Upton Co .....	Hamilton.
Usher's Canning Co .....	St. David.
Wallaceburg Canning Co .....	Wallaceburg.
Wethey T. H. ....	St. Catharines.

## LABOR.

	Females.	Males.
Eastern Ontario, exclusive of Prince Edward County .....	546	297
Prince Edward County .....	895	610
Western Ontario .....	223	121
Southern Ontario .....	2,551	1,515
Total .....	4,215	2,543
Females .....	4,215	
Males .....	2,543	
Total number people .....		6,758

Following are two forms of contract, showing how the two factories named contract for their supplies of produce. They are to a certain degree typical of the contracts used in the Province.





READ YOUR CONTRACT CAREFULLY.

*This Agreement* made the.....day of.....A.D. 190 BETWEEN.....  
of the FIRST PART, and the Napanee Canning Company, Limited, of the SECOND PART :

WITNESSETH, that the said party of the FIRST PART for and in consideration of the promise and agreement hereinafter written and undertaken by the said parties of the SECOND PART, doth hereby promise and agree to sow or plant on suitable, well-fitted ground, and cultivate in first-class order for the season of 190 .....acres with sweet corn  $\frac{1}{2}$  early  $\frac{1}{2}$  late, which the party of the FIRST PART agrees to receive ; and also .....acres of sweet corn which the party of the FIRST PART agrees to deliver in case the party of the SECOND PART shall require the same. ....acres with tomatoes, .....acres with beans, .....acres with sweet peas, .....acres with strawberries, *Wilson's Albany*, .....acres with.....variety .....acres with red raspberries, *Cuthbert Variety*, .....acres with black raspberries, (all seeds to be furnished by the parties of the SECOND PART) and to deliver the sound, merchantable product of same not exceeding two and one-half tons Corn to the acre, Two hundred bushels of 60 lbs., Tomatoes to the acre, Two tons of Green Beans to the acre, Two tons of Sweet Peas to the acre, Two thousand imperial quarts (1 $\frac{1}{4}$  lbs. to the quart) Strawberries to the acre.....imperial quarts (1 $\frac{1}{4}$  lbs. to the quart) Red Raspberries to the acre.....imperial quarts (1 $\frac{1}{4}$  lbs. to the quart) Black Raspberries to the acre, and balance of crop or any they may plant or sow outside of this contract, at same price if required by parties of the SECOND PART to the parties of the SECOND PART at the NAPANEE CANNING CO., Limited ; said delivery shall be made between the first day of Juné, 190 , and the first day of October, 190 , at such times between the aforesaid dates, and in such condition of freshness and maturity as may be required by the said parties of the SECOND PART, their servant or agent to be the exclusive judge of the fitness of the product for canning ; said delivery shall not exceed one-twentieth of the crop on any one day, unless by consent of the parties of the SECOND PART, and no delivery shall be made upon any Saturday or on any day previous to a Statutory or other holiday unless by consent of the parties of the SECOND PART.

IN CONSIDERATION WHEREOF, the said parties of the SECOND PART agree to receive the sound, merchantable product of the same, (not exceeding the aforesaid mentioned quantities to the acre) and pay for the same to the party of the FIRST PART at the rate of : Sweet Corn.....per ton ; Tomatoes.....per bushel of sixty lbs. until Oct. 1st, balance of crop after Oct. 1st to be subject to the call of the NAPANEE CANNING CO., Limited, in such quantity as they may require at prices already named ; Strawberries.....cents imperial quart ; Green Peas, .....per ton in pod ; Green Beans, .....per ton in pod. NAPANEE CANNING Co., Limited, will pay for produce,  $\frac{1}{2}$  on First of November, balance on Jan. 1st, 1906, or will pay in full when full delivery is made less 3% discount.

This contract is to be void in case Factory should be burned or rendered inoperative by any unforeseen cause, PROVIDED ALWAYS, and it is hereby expressly agreed that should the parties of the SECOND PART rebuild the factory after its loss by fire or otherwise as aforesaid so as to be able to manufacture the above as contracted for, then this agreement to remain in full force and effect as though no fire or unforeseen cause had occurred ; and it is further agreed that the printed instructions on the back of this contract are acceded to and are made a part hereof.

And the party of the FIRST PART further agrees to report weekly to the office of the Napanee Canning Co., Limited, at their office Napanee, the prospects of his crop ; and the party of the FIRST PART agrees not to sell any produce to any other party from the above acreage contracted, during the continuance of this agreement, or any they may plant or sow outside of it if required by NAPANEE CANNING CO., Limited, and failing to comply with this contract as above stated then the party of the FIRST PART hereby agrees to pay to the parties of the SECOND PART 25 per cent. LIQUIDATED DAMAGES and not as a penalty for non-fulfilment of this contract. It is also expressly and mutually agreed by and between the said parties to this contract that should any legislation be enacted lowering the present tariff whereby the Canned Goods business of the parties of the SECOND PART might suffer in any particular then and in that case the party of the FIRST PART does hereby consent to a reduction in the prices named above as follows :—on Corn, Peas and Beans, one dollar per ton ; on Tomatoes two cents per bushel ; Berries one cent per quart.

NAPANEE CANNING COMPANY, LIMITED.

Per.....

SIGNED IN DUPLICATE.

Witness.....

(The following appears on back of Form of Contract given on page 142.)

INSTRUCTIONS TO CONTRACTORS.

SEASON OF 190...

*Concerning Produce for Delivery to Napanee Canning Co., Limited, at their  
Factory, at Napanee, Ont.*

Sweet Corn must have good soil, and clean cultivation, and must not be planted within forty rods of other corn or they will readily mix. Successive plantings must be made so that the crop may mature in rotation and prevent overstocking at time of delivery.

Sweet Corn must be picked when young and tender, and in a creamy state, suitable for table use. It must be broken off close to the ear, and delivered immediately after picking, and never left in a wagon or in a heap over night as it will easily heat, and heated corn, nubbins, mixed, and that which is too old will be rejected, and charged back to the parties delivering, although accepted or credited.

Tomatoes must be of the large, smooth, red varieties, picked when red ripe and thoroughly clean and delivered the same day they are picked. Green, unsound, unclean and small tomatoes will not be received.

Peas must be sown early in the season, and at different sowings, and plenty of seed used to the acre. Picked when the pods are well filled, tender and green, and delivered the same day they are picked. Peas are not to be left in bags, in a wagon or in a head over night, or in the sun through the day; heated, shrivelled, dried or discolored pods will be rejected.

Beans must be picked and delivered with the same care as peas. They must be young and tender, and without beans of any size in pods.

All produce must be delivered before 7 o'clock p.m. daily, and on Saturday or day preceding holidays, as within mentioned nothing will be received.

*No payment will be made on Saturday or any Holiday as within mentioned,  
for any produce.*

NAPANEE CANNING CO., Limited, or their agent, to be exclusive judge of the above named products for canning, and when the products do not grade first-class a reduced price may be paid and must be accepted.





ANNUAL REPORT  
OF THE  
FARMERS' INSTITUTES

OF THE  
PROVINCE OF ONTARIO

1906

PART II. MEETINGS AND STATISTICS.

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(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO.





WARWICK BROS & RUTTER, Limited, Printers  
TORONTO

# FARMERS' INSTITUTES OF ONTARIO.

1906-07.

## ANNOUNCEMENT OF SUPERINTENDENT.

This volume contains statistics regarding Farmers' Institutes and announcements of meetings together with names of speakers and subjects. It will be noticed that we have included in the list of meetings some which have already been held, but which are not recorded elsewhere.

The nature of the work carried out during the year has been much the same as in former years. We have, however, given increased prominence to the judging of live stock and the use of illustrative material in imparting information upon the subjects dealt with. We are pleased to note that the results following special meetings in the interests of fruit growers are most gratifying. Some twenty or more co-operative fruit societies are doing effective work in the growing, picking, packing and marketing of fruits of different kinds. Many of these are the outgrowth of special meetings arranged for through this Department. The Department of Farmers' Institutes also arranged for a series of lectures before Horticultural Societies; and, in co-operation with the Dominion Department of Agriculture, held a series of special meetings to encourage the production of good seeds, and to present to the farmers approved methods of combating noxious weeds, which we are sorry to note are gaining ground in some sections of the Province.

### SUMMER MEETINGS.

As will be seen from the records given herewith, we held a number of meetings during the past summer in the northern districts of the Province. In many of these sections it was thought that summer meetings, while probably not so largely attended in some localities as the winter meetings, were of greater benefit to the communities concerned. The speakers are able to judge of the agricultural conditions during the summer months and have the advantage of using live stock in illustrating and demonstrating their lectures. Some twelve points in the Rainy River and Lake of the Woods districts were covered during the past season, and the second annual series of meetings was held in the Temiskaming district.

### WOMEN'S INSTITUTES.

This branch of the work has grown considerably during the past year. The number of Institutes which did effective work is considerable in excess of the preceding year, the total number of branches which are carrying on regular work being about 300, while Institutes are established in 76 electoral districts. The membership at the end of May last was 10,404. The possibilities in connection with the Women's Institute work are becoming more fully realized, and a keener interest is being shown from season to season. The greatest need at this time is that some means be adopted by which systematic help and direction may be furnished to the officers and members. We are pleased to record that the Department has already consented to give assistance along the line indicated.

### CONFERENCE FOR LECTURERS AND OFFICERS.

Provision is being made this season for the holding of a special Conference of Institute lecturers at the Agricultural College, Guelph. By bringing the men who attend the meetings throughout the country in contact with each other and with the lecturers at the College, it is thought that much good will be accomplished by way of deciding upon uniformity of method and the points upon which special importance should be laid. With definiteness of purpose, more uniformity in methods, and a more complete supply of illustrative material, it is certain that much better service will be rendered this year than in former seasons.

We trust that the officers and directors will continue to appreciate the important position which they occupy in furthering the interests of the farmers of the Province. They can do much by thorough advertising, personal invitation, and active interest at the time of the holding of the meetings to make the work successful.

GEO. A. PUTNAM.



## REPORTS OF LOCAL FARMERS' INSTITUTES

Institute District.	Membership, Decem- ber, 1905.	Membership to June, 1906.	No. of meetings held.	Total attendance.	No. of papers read or addresses delivered.	Receipts.				
						Cash on hand per last report.	Members' fees.	Grants.	Receipts from excursions and conventions.	
						\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1. Addington .....	75	74	6	573	19	36 89	18 50	50 00	.....	.....
2. Algoma, Centre .....	154	66	5	498	20	90 41	17 50	50 00	.....	.....
3. Algoma, East .....	137	123	8	1,342	26	44 32	22 00	25 00	24 00	.....
4. Algoma, North Shore .....	.....	52	4	350	16	.....	18 25	.....	.....	.....
5. Amherst Island .....	30	40	4	218	6	90 10	7 50	25 00	.....	.....
6. Brant, North .....	113	257	13	439	39	85 01	50 80	50 00	77 82	.....
7. Brant, South .....	255	318	11	1,235	40	62 41	77 75	50 00	204 20	.....
8. Brockville .....	85	179	8	1,308	35	6 87	44 50	50 00	.....	.....
9. Bruce, Centre .....	109	113	7	556	29	189 28	26 50	25 00	123 55	.....
10. Bruce, North .....	110	122	7	625	20	95 44	21 95	50 00	54 04	.....
11. Bruce, South .....	167	237	9	3,750	32	222 96	39 50	25 00	94 02	.....
12. Bruce, West .....	262	291	8	1,345	26	198 96	73 00	50 00	85 09	.....
13. Carleton .....	230	117	8	935	27	67 04	57 75	50 00	.....	.....
14. Cornwall .....	91	86	6	875	12	39 15	21 00	37 50	.....	.....
15. Dufferin .....	217	324	11	1,486	70	141 74	81 50	25 00	38 00	.....
16. Dundas .....	174	210	8	1,303	36	218 62	44 50	49 85	.....	.....
17. Durham, East .....	209	258	10	573	28	81 48	62 50	55 25	48 50	.....
18. Durham, West .....	150	175	11	795	28	185 75	45 75	50 00	85 60	.....
19. Elgin, East .....	302	304	7	822	34	154 66	74 50	50 00	.....	.....
20. Elgin, West .....	139	143	6	990	24	47 10	34 75	50 00	.....	.....
21. Essex, North .....	114	181	7	930	34	17 23	46 25	50 00	.....	.....
22. Essex, South .....	156	157	8	600	33	55 81	39 25	75 00	.....	.....
23. Frontenac .....	110	124	8	898	28	38 64	27 00	50 00	.....	.....
24. Frontenac, Centre .....	69	90	6	325	17	26 78	18 00	.....	.....	.....
25. Glengarry .....	224	229	7	1,725	33	23 56	57 25	50 00	.....	.....
26. Grenville, South .....	140	176	12	1,130	22	.....	44 00	50 00	.....	.....
27. Grey, Centre .....	205	283	13	1,830	71	.....	68 20	50 00	130 67	.....
28. Grey, North .....	248	287	12	1,075	31	104 12	73 50	50 00	59 92	.....
29. Grey, South .....	262	255	10	2,255	33	156 87	70 75	50 00	224 50	.....
30. Haldimand .....	408	417	11	2,487	46	518 27	98 25	50 00	126 70	.....
31. Halton .....	535	627	11	2,167	20	191 99	123 60	50 00	211 75	.....
32. Hastings, East .....	144	159	11	1,155	41	.....	40 00	50 00	37 55	.....
33. Hastings, North .....	488	162	10	1,010	33	92	60 50	50 00	.....	.....
34. Hastings, West .....	50	65	7	985	20	68 48	15 50	50 00	.....	.....
35. Huron, East .....	307	386	12	2,092	44	224 83	96 25	50 00	68 32	.....
36. Huron, South .....	317	306	9	2,775	46	365 97	78 00	50 00	65 44	.....
37. Huron, West .....	122	94	9	1,720	51	80 99	33 00	50 00	75 57	.....
38. Kent, East .....	184	183	9	700	35	59	45 75	50 00	.....	.....
39. Kent, West .....	211	166	9	1,001	35	39 70	42 25	50 00	.....	.....
40. Lambton, East .....	182	217	10	1,030	45	236 61	51 25	50 00	50 85	.....
41. Lambton, West .....	285	291	10	845	45	193 35	73 25	50 00	50 85	.....
42. Lanark, North .....	193	109	8	654	24	11 56	27 50	50 00	.....	.....
43. Lanark, South .....	92	104	8	865	44	.....	25 75	50 00	.....	.....
44. Leeds, N. and Grenville, N. ....	129	163	8	1,081	41	.....	40 75	50 00	.....	.....
45. Leeds, South .....	225	215	8	1,495	37	5 30	52 75	50 00	.....	.....
46. Lennox .....	80	154	9	908	38	49 98	38 50	50 00	.....	.....
47. Lincoln .....	236	211	9	1,995	25	196 35	57 50	55 00	38 00	.....
48. Manitoulin, East .....	107	41	*	.....	.....	13 02	26 75	25 00	11 00	.....
49. Manitoulin, West .....	36	78	12	†540	†24	32 54	17 50	25 00	.....	.....
50. Middlesex, East .....	329	315	9	1,597	36	265 49	76 00	50 00	131 30	.....
51. Middlesex, North .....	352	350	12	2,110	59	336 55	91 50	50 00	113 95	.....
52. Middlesex, West .....	175	199	7	1,215	35	43 23	51 25	50 00	55 12	.....
53. Monck .....	111	138	7	824	21	4 14	25 50	55 00	.....	.....

\* Meetings were held in June, 1905, and October, 1906.

† Estimated.

FOR THE YEAR ENDING JUNE 30, 1906.

Receipts.—Con.			Expenditure.										
Miscellaneous.	Balance due Treasurer.	Total receipts.	Due Treasurer per last Report.	Expense for meetings.	Secretary's salary, etc.	Postage and stationery.	Printing and advertising.	Lecturers' expenses.	Miscellaneous.	Total expenditure.	Balance on hand.	Total.	No.
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	
		105 39		24 50	20 00	8 65	11 00	.....	6 50	70 65	34 74	105 39	1
1 95		159 86		17 80	15 00	3 00	13 75	.....	13 50	68 05	91 81	159 86	2
2 10		117 42		27 25	25 50	1 50	3 00	18 35	.....	75 60	41 82	117 42	3
		18 25		4 00	.....	1 16	4 75	.....	.....	9 91	8 34	18 25	4
		122 60		4 25	10 00	1 50	4 39	.....	16 00	36 14	86 46	122 60	5
		263 63		78 50	11 85	5 52	37 45	.....	35 20	168 52	95 11	263 63	6
3 00		397 36		20 50	80 40	8 28	55 04	33 10	139 98	337 30	60 06	397 36	7
		101 37		17 00	15 00	6 83	19 70	20 35	21 75	100 63	74	101 37	8
		364 33		35 45	42 75	5 00	22 75	15 00	15 00	135 95	228 38	364 33	9
4 39		225 82		28 30	44 00	5 67	17 95	42 05	9 95	147 92	77 90	225 82	10
		381 48		94 40	42 00	15 25	40 55	.....	17 50	209 70	171 78	381 48	11
6 95		414 00		3 75	61 35	10 74	28 65	.....	102 00	206 49	207 51	414 00	12
		174 79		13 65	29 65	9 80	9 00	.....	11 20	73 30	101 49	174 79	13
		97 65		8 00	27 85	2 50	26 50	9 65	2 50	77 00	20 65	97 65	14
11 71		297 95		64 30	37 60	4 25	34 10	3 75	25 01	169 01	128 94	297 95	15
		312 97		31 50	40 00	4 13	39 54	.....	10 00	125 17	187 80	312 97	16
		247 73		12 25	30 00	7 75	42 40	.....	29 60	122 00	125 73	247 73	17
4 95		372 05		11 50	35 00	2 55	59 55	20 05	27 20	155 85	216 20	372 05	18
4 38		283 54		.....	33 80	2 32	33 50	16 58	40 30	126 50	157 04	283 54	19
		131 85		8 50	25 80	12 59	12 50	7 50	26 20	93 09	38 76	131 85	20
		113 48		17 55	15 00	1 35	12 75	26 03	25 00	97 68	15 80	113 48	21
		170 06		4 50	25 00	4 50	12 23	27 96	68 45	142 64	27 42	170 06	22
		115 64		6 25	20 00	2 25	29 50	20 00	.....	78 00	37 64	115 64	23
		44 78		16 00	.....	1 60	7 50	11 80	5 05	41 95	2 83	44 78	24
2 25		133 06		21 85	31 85	1 50	20 00	10 55	5 75	91 50	41 56	133 06	25
		94 00	9 75	21 30	25 00	3 58	14 25	10 10	3 45	87 43	6 57	94 00	26
21 95		270 82	4 52	58 10	35 50	4 49	16 25	66 13	37 72	222 71	48 11	270 82	27
8 00		295 54		43 10	66 95	5 97	20 16	45 00	12 00	193 18	102 36	295 54	28
107 40		609 52		76 05	130 80	5 03	39 75	28 10	243 30	523 03	86 49	609 52	29
13 39		806 61		120 35	115 80	22 40	105 25	.....	31 85	395 65	410 96	806 61	30
		577 34		112 45	100 00	14 75	57 62	.....	96 00	380 82	196 52	577 34	31
		127 55	3 72	16 00	35 00	13 50	23 75	16 50	.....	108 47	19 08	127 55	32
		111 42		9 45	30 00	3 90	14 50	53 15	.....	111 00	42	111 42	33
1 35		135 33		12 50	30 00	2 50	8 50	13 50	1 00	68 00	67 33	135 33	34
5 93		445 33		59 15	78 50	7 02	24 65	.....	25 15	194 47	250 86	445 33	35
		559 41		67 08	4 85	7 06	40 97	20 05	97 70	237 71	321 70	559 41	36
		239 56		81 55	60 00	4 50	12 76	16 25	20 00	195 06	44 50	239 56	37
		96 34		10 75	25 00	23 04	21 75	9 40	60	90 54	5 80	96 34	38
6 35		138 30		16 67	24 10	9 40	5 50	10 95	.....	66 62	71 68	138 30	39
		388 71		22 00	44 65	6 33	12 25	54 64	24 50	164 37	224 34	388 71	40
		367 45		66 10	47 95	3 60	23 50	14 10	23 00	178 25	189 20	367 45	41
		89 06		39 55	26 10	1 12	11 00	4 20	.....	81 97	7 09	89 06	42
	25 13	100 88	25 43	24 95	25 00	.....	25 50	.....	.....	100 88	.....	100 88	43
85 05	13 61	189 41	27 75	57 60	10 00	4 36	18 25	.....	71 45	189 41	.....	189 41	44
		108 05		67 30	15 00	1 30	14 00	.....	5 50	103 10	4 95	108 05	45
3 30		141 78		19 40	31 50	3 85	12 50	21 00	.....	88 25	53 53	141 78	46
		346 85		16 05	30 00	10 34	56 93	38 50	19 00	170 82	176 03	346 85	47
2 10		77 87		.....	12 50	1 65	9 89	31 25	7 00	62 29	15 58	77 87	48
	2 50	77 54		5 00	15 00	10 29	7 50	39 00	.....	75 77	54	77 54	49
8 53		531 32		77 70	40 00	22 48	36 03	13 35	23 80	213 36	317 96	531 32	50
		592 00		80 70	93 10	8 61	21 50	60 80	30 25	294 96	297 04	592 00	51
3 00		202 60		12 00	40 00	4 62	12 50	21 95	5 10	96 17	106 43	202 60	52
		84 64		10 45	27 00	4 29	15 65	22 45	3 00	82 84	1 80	84 64	53



## REPORTS OF LOCAL FARMERS' INSTITUTES

Institute District.	Membership, December, 1905.	Membership to June, 1906.	No. of meetings held.	Total attendance.	No. of papers read or addresses delivered.	Receipts.				
						Cash on hand per last report.	Members' fees.	Grants.	Receipts from excursions and conventions.	
						\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
54. Muskoka, Centre.....	53	60	5	217	6	17 51	13 00	25 00	10 00	
55. Port Carling Branch.....	25	23	3	200	6	2 28	3 75			
56. Muskoka, North.....	111	128	6	294	29	21 16	27 75	25 00		
57. Muskoka, South.....	103	70	5	252	18	11 05	18 75	30 00		
58. Nipissing, West.....	71	49	8	428	23	20 05	13 50	25 00		
59. Norfolk, North.....	290	325	10	2,055	53	181 57	80 50	50 00	43 85	
60. Norfolk, South.....	112	141	6	745	25	12 77	32 75	50 00	43 85	
61. Northumberland, East....	99	216	8	1,540	28		52 00	50 00	16 54	
62. Northumberland, West....	99	155	7	1,198	31	101 48	38 75	50 00	11 12	
63. Ontario, North.....	264	156	11	593	10	315 32	54 00	75 00	100 00	
64. Ontario, South.....	303	289	11	975	42	93 33	77 75	50 00	101 69	
65. Oxford, North.....	298	265	11	2,035	41	28 85	65 50	50 00	195 10	
66. Oxford, South.....	466	498	14	2,250	56	45 10	131 50	61 73	118 50	
67. Parry Sound, East.....	227	94	18	1,284	101	161 33	53 00	28 00	135 95	
68. Parry Sound, West.....	42	154	7	107	11	24 46	1 50	25 00		
69. Peel.....	411	404	13	2,466	47	58 17	86 50	50 00	197 50	
70. Perth, North.....	280	295	9	1,621	34	136 17	72 50	50 00	200 60	
71. Perth, South.....	243	283	8	2,000	45	255 54	61 00	50 00	113 50	
72. Peterboro, East.....	122	116	8	1,818	46	1 69	27 00	50 00	48 50	
73. Peterboro, West.....	185	185	8	1,542	50	1 89	46 75	50 00	58 50	
74. Prescott.....	78	72	7	376	18	68 94	16 25	50 00		
75. Prince Edward.....	158	223	12	785	27	99 47	97 00	50 00		
76. Rainy River, South.....	78	72	12	524	36		27 00	20 00	2 05	
77. Renfrew, North.....	89	92	7	900	24	18 77	23 25	50 00		
78. Renfrew, South.....	111		6	644	23	140 24	26 00	50 00	3 24	
79. Russell.....	153	140	7	1,825	32		31 25	50 00	29 00	
80. Simcoe, Centre.....	312	335	11	1,428	55	272 98	64 80	25 00	169 80	
81. Simcoe, East.....	77	181	8	766	31	128 94	39 50	25 00	122 80	
82. Simcoe, South.....	139	138	9	752	35	9 43	32 00	25 00	8 00	
83. Simcoe, West.....	203	250	9	1,132	44	323 59	63 25	50 00	167 48	
84. Stormont.....	116	166	8	1,300	30	16 30	41 00	50 00		
85. St. Joseph Island.....	252	211	7	1,602	20	28 73	55 00	41 68		
86. Temiscamingue.....	224	62	10	448	25		4 75	25 00		
87. Victoria, East.....	137	146	9	1,758	37	18 90	34 25	50 00		
88. Victoria, West.....	135	109	7	629	44	22 53	39 60	50 00	29 92	
89. Waterloo, North.....	562	562	14	3,218	59	139 50	131 00	50 00	69 67	
90. Waterloo, South.....	719	705	17	2,891	103	110 15	196 75	50 00	171 10	
91. Welland.....	361	334	11	1,492	54	272 58	94 50	50 00	150 50	
92. Wellington, Centre.....	558	624	10	2,440	47	86 06	157 00	50 00	35 80	
93. Wellington, East.....	412	325	9	1,485	44	44 20	84 00	50 00	38 00	
94. Wellington, South.....	274	309	6	1,270	8	105 48	466 00	50 00		
95. Wellington, West.....	251	291	9	3,003	35	221 67	87 25	50 00	107 00	
96. Union.....	145	187	7	1,149	22	109 90	42 00	37 50	53 45	
97. Wentworth, North.....	332	255	11	2,710	36		62 75	25 00		
98. Wentworth, South.....	271	316	12	2,686	54	64 49	76 25	25 00	66 00	
99. York, East.....	228	295	16	1,528	39	110 84	73 25	50 00	74 05	
100. York, North.....		101	7	255	20					
101. York, West.....	172	219	11	983	54	56 05	35 00	50 00	170 75	
TOTALS:						\$	\$	\$	\$	\$
1905-6.....	20,186	21,052	910	126,084	3,497	9,321	5,631	4,397	5,150	
1904-5.....	22,703	19,793	845	102,008	3,209	9,535	5,009	4,596	4,316	
1903-4.....	23,799	21,257	833	106,719	3,165	8,663	5,636	4,698	6,352	

FOR THE YEAR ENDING JUNE 30, 1906.—Continued.

Receipts.—Con.				Expenditure.											
Miscellaneous.	Balance due Treasurer.	Total receipts.	Due Treasurer per last Report.	Expense for meetings.	Secretary's salary, etc.	Postage and stationery.	Printing and advertising.	Lecturers' expenses.	Miscellaneous.	Total expenditure.	Balance on hand.	Total.	No.		
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.		
1 65		67 16		12 50	12 00	2 50	7 75		3 60	38 35	28 81	67 16	54		
1 50		7 53		25		1 95	1 80	2 25		6 25	1 28	7 53	55		
4 20	17 85	95 96		33 30	40 65	2 66	6 50		12 85	95 96		95 96	56		
2 20		62 00		6 70	25 00	3 09	6 00		5 00	45 79	16 21	62 00	57		
		58 55		6 50	19 85	2 50	3 00			31 85	26 70	58 55	58		
		355 92		61 50	50 00	13 00	31 50	17 40	16 50	189 90	166 02	355 92	59		
		139 37		10 65	50 55	2 63	30 25	13 80	19 05	126 92	12 44	139 37	60		
65 60		184 14	27 90	15 00	32 00	3 93	22 57	30 15	46 55	178 10	6 04	184 14	61		
		201 35		32 75	20 00	4 75	25 50	28 34	13 25	124 59	76 76	201 35	62		
9 65		553 97		13 50	171 25	4 00	56 25	74 85	21 35	341 20	212 77	553 97	63		
5 47		328 24		13 35	55 00		88 49	72 66	5 00	234 50	93 74	328 24	64		
		339 45		34 80	48 70	7 60	67 25	33 05	31 00	222 40	117 05	339 45	65		
7 70		364 53		43 00	55 00	24 47	73 23	95 45	68 85	360 00	4 53	364 53	66		
6 75		385 03		134 75	52 35	14 75	44 82		16 75	263 42	121 61	385 03	67		
	14 54	65 50		40 00	15 00	3 00	7 50			65 50		65 50	68		
		392 17		121 60	124 80	6 71	39 00		5 45	297 56	94 61	392 17	69		
4 50		463 77		67 15	59 15	9 48	71 38	24 85	52 25	284 26	179 51	463 77	70		
		480 04		68 25	20 00	17 00	33 10		18 00	156 35	323 69	480 04	71		
1 95	4 81	133 95		30 05	43 50	3 90	18 25	18 00	20 25	133 95		133 95	72		
		157 14		25 75	37 25	6 50	41 25	13 00	3 00	126 75	30 39	157 14	73		
		135 19		25	29 80	4 82	14 95	4 95		54 77	80 42	135 19	74		
1 99		248 46		43 15	20 00	4 29	64 25	55 55		187 24	61 22	248 46	75		
		49 05		6 50	10 00	4 15	5 50		2 60	28 75	20 30	49 05	76		
	16 69	108 71		50 60	25 00	13 50	23 86		15 75	108 71		108 71	77		
		219 48		18 00	27 50	4 30	48 33	13 92	10 15	122 20	97 28	219 48	78		
		110 25	26 03	11 50	28 00	8 50	14 50	18 75		107 28	2 97	110 25	79		
		532 58		121 59	83 50	7 52	18 05	29 35	19 50	279 51	253 07	532 58	80		
		316 24		62 15	49 50	20 80	65 15	4 15	13 20	214 95	101 29	316 24	81		
	7 05	81 48		12 50	25 60	4 15	17 00	13 45	8 78	81 48		81 48	82		
18 00		622 32		101 50	82 00	8 00	28 28	46 30	117 25	383 33	238 99	622 32	83		
	25	107 55		25 50	26 80	2 50	27 50	22 75	2 50	107 55		107 55	84		
8 00		133 41			25 00	4 71	10 50	10 00	75 91	126 12	7 29	133 41	85		
		29 75				2 32				2 32	27 43	29 75	86		
	11 44	114 59		34 10	20 00	10 69	16 25	23 55	10 00	114 59		114 59	87		
		142 05		16 60	30 25	7 48	23 50	11 95	22 55	116 33	25 72	142 05	88		
		390 17		54 15	106 80	17 75	53 78	46 25	24 45	303 18	86 99	390 17	89		
4 04		532 04		128 50	129 65	14 16	35 75	25 70	151 35	485 11	46 93	532 04	90		
6 45		574 03		119 45	55 00	5 00	12 70	27 85	64 35	284 35	289 68	574 03	91		
10 65		339 51		59 45	48 05	14 06	36 25	25 55	33 40	216 76	122 75	339 51	92		
6 30		222 50		24 25	38 95	5 00	30 00	22 35	47 65	168 20	54 30	222 50	93		
15 60		637 08		10 20	58 50	7 80	34 80		427 00	538 30	98 78	637 08	94		
		465 92		58 00	33 00	13 00	45 05	15 60	92 50	257 15	208 77	465 92	95		
5 25		248 10		15 00	37 05	5 45	12 50	11 45	25 00	106 45	141 65	248 10	96		
	17 80	105 55	16 00	16 75	35 00	5 05	27 75		5 00	105 55		105 55	97		
	16 95	248 69		108 45	25 00	12 34	65 60		37 30	248 69		248 69	98		
		308 14		28 80	58 65	12 89	37 15	13 85	35 00	186 34	121 80	308 14	99		
													100		
		311 80		19 80	59 40	17 15	40 00	32 90	62 00	231 25	80 55	311 80	101		
\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		
495	149	25,143	141	3,673	4,039	712	2,770	1,793	3,102	16,230	8,913	25,143			
463	141	24,061	112	2,959	3,912	666	2,552	1,736	2,803	14,740	9,321	24,061			
530	112	25,991	143	3,532	3,813	791	2,726	2,550	2,895	16,450	9,541	25,991			



## ATTENDANCE, MEMBERSHIP, ETC., 1905-1906.

The membership for the six months ending June, 1906, is 1259 greater than for the corresponding period of 1905. It is gratifying also to note that the total attendance for the year was 23,000 more than for the preceding year, and this total has been exceeded in only two or three previous seasons.

The Institutes holding the largest number of meetings during the year ending May 31st, 1906, are :—

Parry Sound, East.....	18	Huron, East.....	12	Halton.....	11
Waterloo, South.....	17	Middlesex, North.....	12	Hastings, East.....	11
York, East.....	16	Manitoulin, West.....	12	Oxford, North.....	11
Waterloo, North.....	14	Brant, South.....	11	Durham, East.....	10
Oxford, South.....	14	Dufferin.....	11	Grey, South.....	10
Peel.....	13	Durham, West.....	11	Lambton, East.....	10
Brant, North.....	13	Ontario, North.....	11	Lambton, West.....	10
Grey, Centre.....	13	Ontario, South.....	11	Norfolk, North.....	10
Grenville, South.....	12	Simcoe, Centre.....	11	Hastings, North.....	10
Grey, North.....	12	Welland.....	11	Wellington, Centre.....	10
Prince Edward.....	12	York, West.....	11	Temiscamingue.....	10
Wentworth, South.....	12	Haldimand.....	11		

The Institutes having the largest attendance at their meetings are as follows :—

	No. of Meetings.	Attendance.		No. of Meetings.	Attendance.
Bruce, South.....	6	3,750	Haldimand.....	11	2,487
Waterloo, North.....	14	3,218	Peel.....	13	2,466
Wellington, West.....	10	3,003	Wellington, Centre.....	10	2,440
Waterloo, South.....	17	2,891	Grey, South.....	10	2,255
Huron, South.....	9	2,775	Oxford, South.....	14	2,250
Wentworth, South.....	12	2,686	Halton.....	11	2,167

The Institutes having the largest membership to June, 1906, are :—

Waterloo, South.....	705	Middlesex, North.....	350	Huron, South.....	306
Halton.....	627	Simcoe, Centre.....	335	Elgin, East.....	304
Wellington, Centre.....	624	Welland.....	334	Perth, North.....	295
Waterloo, North.....	562	Norfolk, North.....	325	York, East.....	295
Oxford, South.....	498	Wellington, East.....	325	Wellington, West.....	291
Haldimand.....	417	Wentworth, South.....	316	Lambton, West.....	291
Peel.....	404	Middlesex, East.....	315	Ontario, South.....	289
Huron, East.....	386	Wellington, South.....	309	Grey, North.....	287

The Institutes having the smallest membership are :—

Amherst Island.....	40	Temiscamingue.....	62	Manitoulin, West.....	78
Manitoulin, East.....	41	Hastings, West.....	65	Muskoka, Centre.....	83
Nipissing, West.....	49	Muskoka, South.....	70	Cornwall.....	86
Algoma, N. S.....	52	Prescott.....	72	Frontenac, Centre.....	90
Algoma, Centre.....	66	Rainy River S.....	72	Renfrew, North.....	92

## SPECIAL NORTHERN MEETINGS HELD IN 1906.

Dr. H. G. Reed, Georgetown ; Miss L. Gray, 650 Bathurst Street, Toronto.

1	Reay, School House.....	South Muskoka.....	June	4
2	Germania, Wise's School House.....	South Muskoka.....	"	5
3	Purbrook, School House.....	South Muskoka.....	"	6
4	Macaulay, W. C. Denniss' Grove.....	South Muskoka.....	"	7
5	Baysville, Town Hall.....	South Muskoka.....	"	8
6	Bardsville, School House.....	South Muskoka.....	"	9
7	Port Carling, Town Hall.....	Port Carling.....	"	11
8	Brackenrig, School House.....	Port Carling.....	"	12
9	Ufford.....	Centre Muskoka.....	"	13
10	Raymond.....	Centre Muskoka.....	"	14
11	Allansville, Allansville House.....	Centre Muskoka.....	"	15
12	Utterson, Town Hall.....	Centre Muskoka.....	"	16
13	Callander, White's Hall.....	East Parry Sound.....	"	18
14	Powassan, Stewart's Hall.....	East Parry Sound.....	"	19
15	Nipissing, School House.....	East Parry Sound.....	"	20
16	Restoule, School House.....	East Parry Sound.....	"	21
17	Loring, Russell Hall.....	East Parry Sound.....	"	22
18	Arnstein, School House.....	East Parry Sound.....	"	23
19	Golden Valley, School House.....	East Parry Sound.....	"	25
20	Commanda, School House.....	East Parry Sound.....	"	26
21	Trout Creek, Trussler's Hall.....	East Parry Sound.....	"	27
22	South River, Vincent's Hall.....	East Parry Sound.....	"	28
23	Sundridge, Orange Hall.....	East Parry Sound.....	"	29
24	Burk's Falls, Sharp's Hall.....	East Parry Sound.....	"	30
25	Midlothian, School House.....	East Parry Sound.....	July	2
26	Doe Lake, School House.....	East Parry Sound.....	"	3
27	Kearney.....	East Parry Sound.....	"	4
28	Emsdale, Agricultural Hall.....	East Parry Sound.....	"	5
29	Sprucedale, Agricultural Hall.....	East Parry Sound.....	"	6
30	Magnetawan, Orange Hall.....	East Parry Sound.....	"	7

W. C. Shearer, Bright ; Miss B. Maddock, Guelph.

1	Iron Bridge, Orange Hall.....	East Algoma.....	June	6
2	Goldenburg, School House.....	East Algoma.....	"	7
3	Sowerby, Maccabee's Hall.....	East Algoma.....	"	8
4	Livingstone Creek, School House.....	East Algoma.....	"	9
5	Little Rapids, School House.....	East Algoma.....	"	11
6	Alma Heights, School House.....	East Algoma.....	"	12
7	Desbarats.....	North Shore Algoma.....	"	13
8	MacLennan.....	North Shore Algoma.....	"	14
9	Bar River.....	North Shore Algoma.....	"	15
10	Echo Bay.....	North Shore Algoma.....	"	16
11	Tarantorus, School House.....	Centre Algoma.....	"	18
12	West Korah, School House.....	Centre Algoma.....	"	19
13	Base Line, School House.....	Centre Algoma.....	"	20
14	Goulais Bay, School House.....	Centre Algoma.....	"	21
15	East Korah, School House.....	Centre Algoma.....	"	22
16	Walford.....	East Algoma.....	"	25
17	Warren, Town Hall.....	West Nipissing.....	"	26
18	Sturgeon Falls, Town Hall.....	West Nipissing.....	"	27
19	North Bay, Widdifield Hall.....	West Nipissing.....	"	28

Andrew Elliott, Galt ; Miss Laura Rose, Guelph.

(Rainy River and Lake of the Woods Districts.)

1	Kenora.....	June	18
2	Eagle River, School House.....	"	19
3	Oxdrift.....	"	20
4	Dryden, Town Hall.....	"	21
5	Murillo, Town Hall.....	"	22
6	Papoung, School House No. 1.....	"	23
7	Stanley, School House No. 2.....	"	25
8	Hymers, School House.....	"	26



SPECIAL NORTHERN MEETINGS.—*Continued.*

9 O'Connor .....	June 27
10 Bishop's Mills .....	" 28
11 Ouimet, School House .....	" 30
12 Wolf River, Dorion School House .....	July 2

## (Temiscamingue District.)

13 Haileybury, Orange Hall .....	July 5
14 New Liskeard, Orange Hall .....	" 6
15 Hillview, School House .....	" 7
16 Milberta, Newton's Hall .....	" 9
17 Uno Park, School House .....	" 10
18 Hanbury, School House .....	" 11
19 Thornloe .....	" 13
20 Earlton, School House .....	" 14
21 Heaslip, School House .....	" 16
22 Hilliardtown, School House .....	" 17
23 Judge, School House .....	" 18

## E. C. Drury, Crown Hill ; Mrs. D. McTavish, North Bruce.

1 Sheguindah, Trotter's Hall .....	East Manitoulin .....	October 10
2 Green Bay .....	East Manitoulin .....	" 11
3 Manitowaning, Agricultural Hall .....	East Manitoulin .....	" 12
4 Wikwemikong, Council Chamber .....	East Manitoulin .....	" 13
5 Slash, School House .....	East Manitoulin .....	" 15
6 Tehkummah, School House .....	East Manitoulin .....	" 16
7 Big Lake .....	East Manitoulin .....	" 17
8 Mindemoya, School House .....	East Manitoulin .....	" 18
9 Grimesthorpe, School House .....	West Manitoulin .....	" 19
10 Kagawong, Hillard's Hall (afternoon) .....	West Manitoulin .....	" 20
11 Kagawong, No. 1 School House (evening) .....	West Manitoulin .....	" 20
12 Gore Bay, Forester's Hall (afternoon) .....	West Manitoulin .....	" 22
13 Gordon, School House (evening) .....	West Manitoulin .....	" 22
14 Barrie Island, School House .....	West Manitoulin .....	" 23
15 Ice Lake, School House .....	West Manitoulin .....	" 24
16 Poplar, School House .....	West Manitoulin .....	" 25
17 Evansville, School House .....	West Manitoulin .....	" 26
18 Silverwater, School House .....	West Manitoulin .....	" 28
19 Meldrum Bay, Foresters' Hall .....	West Manitoulin .....	" 29
20 Cockburn Island .....	West Manitoulin .....	November 1
21 Richards' Landing, Town Hall .....	St. Joseph Island .....	" 5
22 Kentvale, Kent's Hall .....	St. Joseph Island .....	" 6
23 Tenby Bay, School House .....	St. Joseph Island .....	" 7
24 Carterton, Town Hall .....	St. Joseph Island .....	" 8
25 Marksville, Town Hall .....	St. Joseph Island .....	" 9

## SPECIAL MEETINGS FOR FRUIT GROWERS

Delegates :—D. Johnson, Forest ; A. Gifford, Meaford.

Simcoe .....	March 2	Thornbury .....	March 26
Ingersoll .....	" 12	Meaford .....	" 27
Burford .....	" 13	Duntroon .....	" 28
Oakville .....	" 14	Kimberley .....	" 29
Clarkson .....	" 15	Churchill .....	" 30
Orillia .....	" 16	Burlington .....	" 31
		Sparta .....	April 2

Delegate :—A. E. Sherrington, Walkerton.

Owen Sound .....	March 10	Newcastle .....	March 16
Forest .....	" 12	Port Elgin .....	" 30
Thedford .....	" 13	Arkona .....	May 31
Arkona .....	" 14	Orillia .....	June 28
Belleville .....	" 15		

SPECIAL MEETINGS.—*Continued.*

Delegates :—A. E. Sherrington, Walkerton ; P. J. Carey, Fruit Division, Ottawa.

Parkhill.....	March 26	Mount Brydges.....	March 28
Ilderton.....	" 27		

D. Johnson, Forest, and P. J. Carey.

Burgessville.....	April 17	Trenton.....	April 20
(Mr. Johnson alone)		Baltimore.....	" 23
Brighton.....	" 19	(Mr. Johnson alone)	

## HORTICULTURAL MEETINGS

A circular letter was addressed to the secretaries of Horticultural Societies throughout the Province, offering to furnish a speaker free of cost, except that incurred for entertainment during the stay of the lecturer. The following meetings were arranged for :—

Lecturer :—A. B. Cutting, St. Catharines, Ont.

Woodstock.....	April 2	Kingston.....	April 19
Aylmer.....	" 4	Smith's Falls.....	" 20
Port Dover.....	" 5	Perth.....	" 21
Brantford.....	" 6	Lindsay.....	" 24
Napanee.....	" 17	Thornbury.....	" 26
Picton.....	" 18	Midland.....	" 27

Lecturer :—Wm. Hunt, O.A.C., Guelph.

Grimsby.....	April 9	Merritton.....	April 12
St. Catharines.....	" 10	Niagara Falls.....	" 13
Port Dalhousie.....	" 11		

Lecturer :—Prof. H. L. Hutt, O.A.C., Guelph.

Owen Sound.....	April 5	Stratford.....	April 10
Kincardine.....	" 6	Hespeler.....	
Seaforth.....	" 19	Brampton.....	May 1

Lecturer :—H. S. Peart, O.A.C., Guelph, Ont.

Durham.....	April 3	Elmira.....	April 6
Waterloo.....	" 5		

## SPECIAL SEED MEETINGS.

The Dominion and Provincial Departments of Agriculture co-operated in holding Special Seed Meetings as indicated below, from June 15 to 28 inclusive.

## LIST OF MEETINGS AND SPEAKERS.

DIVISION 1. Speakers :—Simpson Rennie, Toronto ; L. E. Annis, Scarboro.

Hespeler, Dundee, Waterloo, Embro, Thamesford, Norwich, Burford, Onondaga, Port Rowan, Vittoria, Dutton, Highgate, Blenheim, South Woodslee, Appin, Crediton, Brussels.

DIVISION 2. Speakers :—Anthony Forster, Markham ; D. James, Langstaff.

Claude, Shelburne, Dundalk, Kimberley, Durham, Owen Sound, Meaford, Duntroon, Creemore, Beeton, Palgrave, Cookstown, Barrie, Randolph, Elmvale, Minesing, Bradford.

DIVISION 3. Speakers :—A. J. Reynolds, Scarboro Junction ; Geo. Carlaw, Warkworth.

Thistleton, Maple, Manchester, Unionville, Locust Hill, Bethesda, Claremont, Taunton, Port Perry, Uxbridge, Udora, Sutton West, Cannington, Beaverton, Woodville, Little Britain, Warsaw, Norwood, Lindsay, Oakwood, Stouffville.

DIVISION 4. Speakers :—W. S. Fraser, Bradford ; C. W. Nash, Toronto.

Solina, Tyrone, Orono, Millbrook, Baillieboro, Garden Hill, Canton, Cobourg, Warkworth, Hastings, Madoc, Tweed, Frankford, Belleville, Ameliasburg, Newburgh, Stella.



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LIST OF MEETINGS AND SPEAKERS.—*Concluded.*

T. G. Raynor, Seed Division, Ottawa, replaced speakers announced above as follows :—  
L. E. Annis, first three meetings Division 1 ; D. James, last eight meetings of Division 2 ; and  
Geo. Carlaw, last four meetings of Division 3.

The topics dealt with at these meetings are given herewith :

(a) The best Method of Producing Pure, Strong Seeds of Clover, Timothy and Alsike, with Special Reference to the Preparation of Seed Bed and Kind of Seed used.

(b) The Cleaning of Clover Seed Crops before being cut.

(c) Weeds, and How they Become Introduced on the Farm ; The Knowledge of their Nature and Growth an Essential to their Control and Eradication.

(d) The Best Method of Improving the Yield and Quality of Potatoes by Seed Selection.

(e) The Advantage of Maintaining on a Farm a Special Breeding Plot for Seed Oats, Wheat, Barley and Corn.

(f) Soil Cultivation and its Relation to Maintaining and Improving the Vigor and Productiveness of Field Crops.

(g) The marketing of Pure Commercial Seed.

(h) The Ontario Laws Relative to the Destruction of Noxious Weeds.

As compared with the previous year, a greater interest was exhibited in these meetings, and the attendance was much larger. We are continually receiving from Institute officers, seedsmen and others expressions as to the improvement in the quality of seed produced and the greater care shown by farmers in selecting and purchasing their seeds.

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# INSTITUTE MEETINGS AND DELEGATES THEREFOR.

## REGULAR MEETINGS.

DIVISION 1. H. Jones, Maitland; W. C. Shearer, Bright; Miss G. Gray, Toronto,  
Jan. 7; Miss L. Shuttleworth, Guelph, Jan. 14, 15, 18 and 19;  
Miss A. Smith, Hamilton, Jan. 23—25.

1 Kincardine, Town Hall.....	C. Bruce.....	January	4
2 Ripley, Township Hall.....	C. Bruce.....	"	5
3 Holyrood, Township Hall.....	S. Bruce.....	"	7
4 Kintail, Young's Hall.....	W. Huron.....	"	8
5 Auburn, Orange Hall.....	W. Huron.....	"	9
6 Brussels, Town Hall.....	E. Huron.....	"	10
7 Belmore, Foresters' Hall.....	S. Bruce.....	"	11
8 Wroxeter, Town Hall.....	E. Huron.....	"	12
9 Durham, Town Hall.....	S. Grey.....	"	14
10 Hanover, Telford's Hall.....	S. Grey.....	"	15
11 Warton, Town Hall.....	N. Bruce.....	"	16
12 Hepworth, School House.....	N. Bruce.....	"	17
13 Tara, Council Chambers.....	W. Bruce.....	"	18
14 Port Elgin, Town Hall.....	W. Bruce.....	"	19
15 Lakelet, Temperance Hall.....	Union.....	"	21
16 Lavery's School House.....	Union.....	"	22
17 Acton, Town Hall.....	Halton.....	"	23
18 Georgetown, Town Hall.....	Halton.....	"	24
19 Hornby, Orange Hall.....	Halton.....	"	25
20 McCurdy's.....	Halton.....	"	26

DIVISION 2. W. Elliott, Galt; A. E. Sherrington, Walkerton, Jan. 3—11; J. Gardhouse,  
Highfield, Jan. 12—25; Miss G. Gray, Toronto, Jan. 3 and 9;  
Miss Agnes Smith, Hamilton, Jan. 12—16.

1 Plattsville, Town Hall.....	N. Oxford.....	January	3
2 Atwood, Town Hall.....	N. Perth.....	"	4
3 Millbank, Town Hall.....	N. Perth.....	"	5
4 Mitchell, Town Hall.....	S. Perth.....	"	7
5 St. Mary's, Town Hall.....	S. Perth.....	"	8
6 Kintore, Foresters' Hall.....	N. Oxford.....	"	9
7 Lambeth, Town Hall.....	E. Middlesex.....	"	10
8 Ilderton, Oddfellow's Hall.....	E. Middlesex.....	"	11
9 Coldstream, Town Hall.....	N. Middlesex.....	"	12
10 Beechwood, Grange Hall.....	N. Middlesex.....	"	14
11 Ailsa Craig, Town Hall.....	N. Middlesex.....	"	15
12 Parkhill, Town Hall.....	N. Middlesex.....	"	16
13 Exeter, Town Hall.....	S. Huron.....	"	17
14 Brucefield, Dixon's Hall.....	S. Huron.....	"	18
15 Inwood, Orange Hall.....	E. Lambton.....	" 19 & 20	
16 Brigden.....	W. Lambton.....	" 22 & 23	
17 Walker's School House.....	W. Middlesex.....	"	23
18 Middlemiss, Village Hall.....	W. Middlesex.....	"	24
			5

DIVISION 3. J. F. Lavery, V. S., Sunderland; J. N. Paget, Canboro, Jan. 4—10; J. E. Orr,  
Fruitland, Jan. 11—24; Miss I. Rife, Hespeler, Jan. 9—12;  
Mrs. C. Campbell, Windsor, Jan. 16, 17 and 23.

1 Waterford, Town Hall.....	N. Norfolk.....	January	4
2 Boston, Foresters' Hall.....	N. Norfolk.....	"	5
3 Delhi, Morgan's Hall.....	N. Norfolk.....	"	7
4 Courtland, Town Hall.....	N. Norfolk.....	"	8
5 Norwich, Town Hall.....	S. Oxford.....	"	9
6 Mt. Elgin, Foresters' Hall.....	S. Oxford.....	"	10
7 Aylmer, Opera House.....	E. Elgin.....	" 11 & 12	
8 Shedden, Morrison's Hall.....	W. Elgin.....	"	14
9 West Lorne, Township Hall.....	W. Elgin.....	"	15
10 Bridge End, Town Hall.....	E. Kent.....	"	16
11 Croton, Town Hall.....	E. Kent.....	"	17



REGULAR MEETINGS.—*Continued.*

12 Valetta, Township Hall.....	W. Kent.....	January 18
13 Romney, Township Hall.....	W. Kent.....	" 19
14 Leamington, Town Hall.....	S. Essex.....	" 21 & 22
15 Oldcastle, Town Hall.....	N. Essex.....	" 23
16 Belle River, Town Hall.....	N. Essex.....	" 24

DIVISION 4. Dr. J. Standish, Walkerton; Jno. C. Shaw, Norwich, Jan. 3—15;  
Mrs. Lillian Gray Price, Toronto, Jan. 11, 12, 16 and 17.  
Geo. Carlaw, Warkworth, Jan. 16—26.

1 Sheridan.....	Halton.....	January 3
2 Palermo.....	Halton.....	" 4
3 Waterdown, Township Hall.....	N. Wentworth.....	" 5
4 Freelon, McFarlane's Hall.....	N. Wentworth.....	" 7
5 Rockton, Township Hall.....	N. Wentworth.....	" 8
6 Burford, Cornish Hall.....	S. Brant.....	" 9
7 Ohsweken, Council House.....	S. Brant.....	" 10
8 Onondaga, Township Hall.....	N. Brant.....	" 11
9 St. George, Mechanic's Hall.....	N. Brant.....	" 12
10 Ancester, Town Hall.....	S. Wentworth.....	" 14
11 Stoney Creek, Institute Hall.....	S. Wentworth.....	" 15
12 Campden, Fry's Hall.....	Lincoln.....	" 16
13 St. David's School House.....	Lincoln.....	" 17
14 Niagara Falls, S., Forestry Hall.....	Wellsand.....	" 18
15 Willoughby, Town Hall.....	Wellsand.....	" 19
16 Pelham Centre, Town Hall.....	Monck.....	" 21
17 Attercliffe, Station, School House.....	Monck.....	" 22
18 Cayuga, Town Hall.....	Haldimand.....	" 23
19 Hagersville.....	Haldimand.....	" 24
20 Vittoria, Lecture Room.....	S. Norfolk.....	" 25
21 Langton, Town Hall.....	S. Norfolk.....	" 26

DIVISION 5. E. C. Drury, Crown Hill; J. L. Warren, Acton, Jan. 3—16; J.M. McCallum, Shakespeare, Jan. 24 and 25; Miss Smith, Hamilton, Jan. 3, 4, 5 and 9; Miss G. Gray, Toronto, Jan. 10—14; Miss B. Carter, Guelph, Jan. 17—23.

1 Eden Mills, Hall. (afternoon).....	S. Wellington.....	January 3
2 Arkell, School House. (evening).....	S. Wellington.....	" 3
3 S. S. No. 6. (afternoon).....	S. Wellington.....	" 4
4 Aberfoyle, Town Hall. (evening).....	S. Wellington.....	" 4
5 Preston, Town Hall.....	S. Waterloo.....	" 5
6 Haysville, Village Hall.....	S. Waterloo.....	" 7
7 Waterloo, Town Hall.....	N. Waterloo.....	" 8
8 St. Jacob's, Wideman's Hall.....	N. Waterloo.....	" 9
9 Glen Allan, Church Basement.....	W. Wellington.....	" 10
10 Drayton, Town Hall.....	W. Wellington.....	" 11 & 12
11 Moorefield, Township Hall.....	W. Wellington.....	" 14
12 Conn, Orange Hall (afternoon).....	E. Wellington.....	" 15
13 Conn, School House (evening).....	E. Wellington.....	" 15
14 Kenilworth, School House.....	E. Wellington.....	" 16
15 Annan & Leith, Orange Hall.....	N. Grey.....	" 17
16 Strathavon, Hall.....	N. Grey.....	" 18
17 Owen Sound, Council Chambers.....	N. Grey.....	" 19
18 Kemble, School House. (afternoon).....	N. Grey.....	" 21
19 Brown's School House. (evening).....	N. Grey.....	" 21
20 Kilsyth, Hall.....	N. Grey.....	" 22
21 Desboro, Hall. (afternoon).....	N. Grey.....	" 23
22 Chatsworth, Hall. (evening).....	N. Grey.....	" 23
23 Bond Head, Orange Hall.....	S. Simcoe.....	" 24
24 Churchill, Orange Hall.....	S. Simcoe.....	" 25

DIVISION 6. Dr. J. F. Lavery, Sunderland; Dr. Annie Backus, Aylmer.

1 Bethany, Church Basement.....	C. Wellington.....	December 3
2 Metz, Orange Hall.....	C. Wellington.....	" 4
3 Ospringle, School House.....	C. Wellington.....	" 5
4 Marsville, Anthony's Hall.....	C. Wellington.....	" 6
5 Hillsburg, Town Hall.....	C. Wellington.....	" 7

REGULAR MEETINGS.—*Continued.*

DIVISION 7. E. C. Drury, Crown Hill ; W. F. Stephen, Huntingdon, Que., Dec. 3—18.  
L. Annis, Scarboro, Nov. 28—Dec. 1 ; Miss Smith, Nov. 28—Dec. 4.

1	Shelburne, Town Hall.....	Dufferin.....	November	28
2	Orangeville, Town Hall.....	Dufferin.....	"	29
3	Caledon, Township Hall.....	Peel.....	"	30
4	Streetsville, Oddfellows' Hall.....	Peel.....	December	1
5	Weston, Dufferin Hall.....	W. York.....	"	3
6	Woodbridge, Orange Hall.....	W. York.....	"	4
7	Aurora, Town Hall.....	N. York.....	"	5
8	Queensville, Soule's Hall.....	N. York.....	"	6
9	Agincourt, Temperance Hall.....	E. York.....	"	7
10	Stouffville, Council Chambers.....	E. York.....	"	8
11	Goodwood, Township Hall.....	N. Ontario.....	"	10
12	Sunderland, Township Hall.....	N. Ontario.....	"	11
13	Pontypool, Orange Hall (afternoon).....	E. Durham.....	"	12
14	Bethany, Town Hall (evening).....	E. Durham.....	"	12
15	Monaghan S. S. Hall (afternoon).....	E. Durham.....	"	13
16	Millbrook, Town Hall (evening).....	E. Durham.....	"	13
17	Kendal, Foresters' Hall (afternoon).....	W. Durham.....	"	14
18	Orono, Town Hall (evening).....	W. Durham.....	"	14
19	Bowmanville, Town Hall (afternoon).....	W. Durham.....	"	15
20	Hampton, Town Hall (evening).....	W. Durham.....	"	15
21	Myrtle, Temperance Hall.....	S. Ontario.....	"	17
22	Pickering, Fire Hall.....	S. Ontario.....	"	18

DIVISION 8. H. Glendinning ; J. G. Clark, Ottawa ; Miss Maddock, Guelph,  
Nov. 28—Dec. 4.

1	Woodville, Village Hall.....	W. Victoria.....	November	28
2	Lindsay, Town Hall.....	W. Victoria.....	"	29
3	Bobcaygeon, Town Hall.....	E. Victoria.....	"	30
4	Fenelon Falls, Dickon's Hall.....	E. Victoria.....	December	1
5	Lakefield, Town Hall.....	W. Peterboro.....	"	3
6	Peterboro, City Hall (afternoon).....	W. Peterboro.....	"	4
7	North Monaghan, Town Hall (evening).....	W. Peterboro.....	"	4
8	Norwood, Town Hall.....	E. Peterboro.....	"	5
9	Keene, Township Hall.....	E. Peterboro.....	"	6
10	Warkworth, Warkworth Hall.....	E. Northumberland.....	"	7
11	Hastings.....	E. Northumberland.....	"	8
12	Menie, Lamb's Hall.....	E. Northumberland.....	"	10
13	Springbrook, Town Hall.....	N. Hastings.....	"	11
14	Queensboro.....	N. Hastings.....	"	12
15	Tweed, Town Hall.....	E. Hastings.....	"	13 & 14

DIVISION 9. T. G. Raynor, Ottawa, Nov. 28—Dec. 5 ; D. Johnson, Forest, Dec. 7—14 ; G. Carlaw,  
Warkworth, Dec. 6—14 ; T. H. Mason, Strathfordville, Nov. 28—Dec. 14 ;  
Miss G. Gray, Toronto, Dec. 8 and 10.

Mr. G. G. Publow, Chief Instructor for Eastern Ontario, will attend meetings at Enterprise  
and Wolfe Island.

1	Joyceville, Joyceville.....	Frontenac.....	November	28
2	Wolfe Island, Township Hall.....	Frontenac.....	"	29
3	Emerald, Cheese Factory.....	Amherst Island.....	"	30
4	Stella, Town Hall.....	Amherst Island.....	December	1
5	Napanee, Town Hall.....	Lennox.....	"	3
6	Selby, Town Hall.....	Lennox.....	"	4
7	Tamworth, Town Hall.....	Addington.....	"	5
8	Enterprise, Meritt's Hall.....	Addington.....	"	6
9	Cannifton, Town Hall.....	E. Hastings.....	"	7
10	Wallbridge, Town Hall.....	W. Hastings.....	"	8
11	Frankford, Curry's Hall.....	W. Hastings.....	"	10
12	Bloomfield Town Hall.....	Pr. Edward.....	"	11
13	Ameliasburg, Town Hall.....	Pr. Edward.....	"	12
14	Grafton, Grafton Hall.....	W. Northumberland.....	"	13
15	Harwood, Boyle's Hall.....	W. Northumberland.....	"	14



## REGULAR MEETINGS.—Continued.

DIVISION 10. T. McMillan, Seaforth, Nov. 28—Dec. 13; J. N. Paget, Canboro, Nov. 28—Dec. 15.  
 One of the Dairy Instructors will attend on Dec. 14 and 15;  
 Miss L. Rose, Guelph, Dec. 14, 15.

1 McDonald's Corners.....	N. Lanark	November	28
2 Lanark Village.....	N. Lanark	"	29
3 Perth, Town Hall.....	S. Lanark	"	30
4 Smith's Falls, Town Hall.....	S. Lanark	December	1
5 Merrickville, Town Hall.....	N. Leeds	"	3
6 Kemptville, Town Hall.....	N. Leeds	"	4
7 Spencerville, Town Hall.....	S. Grenville	"	5
8 North Augusta.....	S. Grenville	"	6
9 Lyn, School House.....	Brockville	"	7
10 Athens, Town Hall.....	Brockville	"	8
11 Elgin, Town Hall.....	S. Leeds	"	10
12 Gananoque, Town Hall.....	S. Leeds	"	11
13 Parham, I.O.O.F.....	C. Frontenac	"	12
14 Mountain Grove, Town Hall.....	C. Frontenac	"	13
15 Brinston's Corners.....	Dundas	"	14
16 North Williamsburg.....	Dundas	"	15

DIVISION 11. Dr. H. G. Reed, Georgetown; J. H. Echlin, Balderson;  
 Miss Rose, Guelph, Dec. 18 and 19.

1 Aultsville.....	Stormont	November	2
2 South Branch, Patrons' Hall.....	Cornwall	"	39
3 Cornwall Centre, Township Hall.....	Cornwall	December	
4 Lancaster, Public Hall.....	Glengarry	"	0
5 Martintown, St. Andrew's Hall.....	Glengarry	"	1
6 Greenfield, Town Hall.....	Glengarry	"	2
7 Varkleek Hill, Town Hall.....	Prescott	"	6 & 7
8 Moose Creek.....	Stormont	"	5
9 Rockland, Town Hall.....	Russell	"	10 & 17
10 Vernon, Orange Hall.....	Russell	"	10
11 Bell's Corners.....	Carleton	"	12
12 Galetta, White's Hall.....	Carleton	"	13
13 Renfrew, Temperance Hall.....	S. Renfrew	"	15 & 14
14 Douglas, Temperance Hall.....	N. Renfrew	"	17
15 Osceola, School House.....	N. Renfrew	"	18
			9

DIVISION 12. W. S. Fraser, Bradford; H. Grose, Lefroy.

1 Gravenhurst, Town Hall (afternoon).....	S. Muskoka	January	3
2 Alport, School House (evening).....	S. Muskoka	"	3
3 Reay, School House (afternoon).....	S. Muskoka	"	4
4 Germania, School House (evening).....	S. Muskoka	"	4
5 Fraserburg, School House (afternoon).....	S. Muskoka	"	5
6 Uffington, Crosier's Hall (evening).....	S. Muskoka	"	5
7 Baysville, Town Hall (afternoon & evening).....	S. Muskoka	"	7
8 Bardsville, School House (afternoon).....	S. Muskoka	"	8
9 Falkenburg, School House (evening).....	S. Muskoka	"	8
10 Port Carling, Town Hall.....	Port Carling	"	9
11 Brackenrig, School House.....	Port Carling	"	10
12 Windermere, Atkin's Hall (afternoon).....	C. Muskoka	"	11
13 Ufford, School House (evening).....	C. Muskoka	"	11
14 Raymond, Orange Hall (afternoon).....	C. Muskoka	"	12
15 Utterson, Town Hall (evening).....	C. Muskoka	"	12
16 Esson's School House (afternoon).....	C. Muskoka	"	14
17 Allansville, Hall (evening).....	C. Muskoka	"	14

## SPECIAL SERIES—NORTH HASTINGS.

W. F. Kydd, Simcoe ; Miss I. Rife, Hespeler.

St. Ola (aft. and eve.)	November	26
The Ridge, School House (aft. and eve.)	"	27
Paudash Lake, or Wood, P.O., School House (aft. and eve.)	"	28
L'Amable, Town Hall (aft. and eve.)	"	29
Turriff (aft. and eve.)	"	30
Bronson, Mr. H. Weese's place (afternoon)	December	1
McArthur's Mills, McArthur's Hall (aft. and eve.)	"	3
Fort Stewart, Forester's Hall (aft. and eve.)	"	4
New Carlow, School House (aft. and eve.)	"	5
Hybla, School House (afternoon)	"	6
Maynooth, Town Hall (aft. and eve.)	"	7
Bancroft, Town Hall (aft. and eve.)	"	8

## SUPPLEMENTARY MEETINGS.

DIVISION 1. W. F. Kydd, Simcoe ; J. M. McCallum, Shakespeare, Feb. 15—26 ;  
Miss B. Maddock, Guelph, Feb. 4 and 8 ; Dr. Annie Backus, 25 and 26.

1 Fordwich, Foresters' Hall	E. Huron	February	4
2 Bluevale, Foresters' Hall	E. Huron	"	5
3 Jamestown, Victoria Hall	E. Huron	"	6
4 Molesworth, Orange Hall	E. Huron	"	7
5 Ethel, Town Hall	E. Huron	"	8
6 Walton, A.O.U.W. Hall	E. Huron	"	9
7 Harlock, School House	E. Huron	"	11
8 Winthrop, Scarlett's Hall	E. Huron	"	12
9 St. Columbus, School House	E. Huron	"	13
10 Fowlers, School House	E. Huron	"	14
11 Londesborough, Brown's Hall	W. Huron	"	15
12 Holmesville, Wilson's Hall	W. Huron	"	16
13 Benmiller, Foresters' Hall	W. Huron	"	18
14 Goderich, Temperance Hall	W. Huron	"	19
15 Nile, Orange Hall	W. Huron	"	20
16 St. Helen's, Mechanics' Institute Hall	W. Huron	"	21
17 Bervie, Township Hall	C. Bruce	"	22
18 Glamis, Methodist Church	C. Bruce	"	23
19 Paisley, Town Hall	C. Bruce	"	25
20 Gillies' Hill, Township Hall	C. Bruce	"	26

DIVISION 2. Dr. H. G. Reed, Georgetown ; D. James, Langstaff, Jan. 4 and 5 ;  
G. Barbour, Crosshill, Jan. 23—Feb. 7 ; Miss B. Miller, Guelph, Jan. 7—22.

1 Meaford, Town Hall	N. Grey	January	4
2 Snyder's School House	N. Grey	"	5
3 Thornbury, Town Hall	C. Grey	"	7
4 Heathcote, Orange Hall	C. Grey	"	8
5 Ravenna, Town Hall	C. Grey	"	9
6 Kimberley, Union Hall	C. Grey	"	10
7 Temple Hill, Pres. Ch. Basement	C. Grey	"	11
8 Walter's Falls, A.O.U.W. Hall	C. Grey	"	12
9 Holland Centre, Town Hall	C. Grey	"	14
10 Markdale, Council Chamber	C. Grey	"	15
11 Priceville, Watson's Hall	C. Grey	"	16
12 Hopeville, Allan's Hall	C. Grey	"	17
13 Dundalk, Town Hall	C. Grey	"	18
14 Badgeros, Orange Hall	C. Grey	"	19
15 Maxwell, Orange Hall (aft.)	C. Grey	"	21
16 Feversham (Judging Class in A.M.)	C. Grey	"	22
17 Midhurst, Patron's Hall	C. Simcoe	"	23
18 Minesing, Workmen's Hall	C. Simcoe	"	24
19 Phelpsston, Murphy's Hall	C. Simcoe	"	25
20 New Flos, School House	C. Simcoe	"	26



SUPPLEMENTARY MEETINGS.—*Continued,*

21 Allanwood, Church Basement.....	C. Simcoe.....	January 28
22 Wyevale, Orange Hall.....	C. Simcoe.....	" 29
23 Wyebridge, Orange Hall.....	C. Simcoe.....	" 30
24 LeFavre's Corners, School House.....	C. Simcoe.....	" 31
25 Lefontaine, Foresters' Hall.....	C. Simcoe.....	February 1
26 Vasey, Orange Hall.....	C. Simcoe.....	" 2
27 New Lowell, Town Hall.....	W. Simcoe.....	" 4
28 Stayner, Stewart's Hall.....	W. Simcoe.....	" 5
29 Orillia, Council Chamber.....	E. Simcoe.....	" 6 & 7

DIVISION 3. Wm. Elliott, Galt; J. L. Warren, Acton, Feb. 1—12; Jno. Buchanan, B.S.A.,  
Guelph, Feb. 13—23; Miss G. Gray, Toronto, Feb. 13, 15, 18, 19 and 21.

1 Lion's Head, Town Hall.....	N. Bruce.....	February 1
2 Spry's School House.....	N. Bruce.....	" 2
3 Mar, School House.....	N. Bruce.....	" 4
4 Allenford, Orange Hall.....	W. Bruce.....	" 5
5 Burgoyne, Church Vestry (aft.).....	W. Bruce.....	" 6
6 McLennan's School House (eve.).....	W. Bruce.....	" 6
7 Underwood, Town Hall.....	W. Bruce.....	" 7
8 Tiverton, Town Hall.....	W. Bruce.....	" 8
9 Lucknow, Town Hall.....	S. Bruce.....	" 9
10 Teeswater.....	S. Bruce.....	" 11
11 Mildmay, Town Hall.....	S. Bruce.....	" 12
12 Walkerton, Town Hall.....	S. Bruce.....	" 13
13 Cargill, Public Library.....	S. Bruce.....	" 14
14 Elmwood, Wildfang's Hall.....	S. Grey.....	" 15
15 Aytton, Doersam's Hall.....	S. Grey.....	" 16
16 Holstein, Agricultural Hall.....	S. Grey.....	" 18
17 Dromore, Russell Hall.....	S. Grey.....	" 19
18 Harriston, Town Hall.....	Union.....	" 20
19 Clifford, Town Hall.....	Union.....	" 21
20 Drew, Temperance Hall.....	Union.....	" 22
21 Teviotdale, Forester's Hall.....	Union.....	" 23

DIVISION 4. Wm. Reid, Lucan, Feb. 1—7; Dr. J. F. Lavery, Sunderland, Feb. 8—22;  
W. S. Fraser, Bradford, Feb. 8—22; Mrs. L. Gray Price, Toronto,  
Feb. 1—7; Miss Smith, Hamilton, Feb. 19 and 20.

1 Lobo, Masonic Hall.....	N. Middlesex.....	February 1
2 Granton, Harmony Hall.....	N. Middlesex.....	" 2
3 Moonesville, Maccabee's Hall.....	N. Middlesex.....	" 4
4 West McGillivray, Town Hall.....	N. Middlesex.....	" 5
5 Greenway, Wilson's Hall.....	N. Middlesex.....	" 6
6 Sylvan, Maccabee's Hall.....	N. Middlesex.....	" 7
7 Thedford, McKenzie's Hall.....	E. Lambton.....	" 8
8 Camlachie, Bridge's Hall.....	E. Lambton.....	" 9
9 Petrolea, Town Hall.....	W. Lambton.....	" 11
10 Oakdale, School House.....	W. Lambton.....	" 12
11 Rutherford, Hall.....	W. Lambton.....	" 13
12 Beecher, Foresters' Hall.....	W. Lambton.....	" 14
13 Wilkesport, Hamilton's Hall.....	W. Lambton.....	" 15
14 Courtwright, Stewart's Hall.....	W. Lambton.....	" 16
15 Sarnia, Town Hall.....	W. Lambton.....	" 18
16 Wyoming, Butler's Hall.....	E. Lambton.....	" 19
17 Shetland, Peter's Hall.....	E. Lambton.....	" 20
18 Alvinston, Code's Hall.....	E. Lambton.....	" 21
19 Warwick, Orange Hall.....	E. Lambton.....	" 22

DIVISION 5. Major Sheppard, Queenston; J. Gardhouse, Highfield, Feb. 1—8;  
Dr. H. G. Reed, Georgetown, Feb. 9—21; Miss B. Maddock, Guelph, Feb. 5 and 6.

1 Gowanstown, Township Hall.....	N. Perth.....	February 1
2 Carthage, Forester's Hall.....	N. Perth.....	" 2
3 Rostock, Town Hall.....	N. Perth.....	" 4
4 Milverton, Groch's Hall.....	N. Perth.....	" 5
5 Hampstead, School House.....	N. Perth.....	" 6

SUPPLEMENTARY MEETINGS.—*Continued.*

6 Shakespeare, Temperance Hall	N. Perth	February	7
7 Tavistock, Public Hall	S. Perth	"	8
8 Sebringville, Foresters' Hall	S. Perth	"	9
9 Fullerton, Township Hall	S. Perth	"	11
10 Staffa, Public Hall	S. Perth	"	12
11 Kirkton, Aberdeen Hall	S. Perth	"	13
12 Elmville, Township Hall	S. Huron	"	14
13 Crediton, Township Hall	S. Huron	"	15
14 Grand Bend, Public Hall	S. Huron	"	16
15 Zurich, Township Hall	S. Huron	"	18
16 Hensall, Willar's Hall	S. Huron	"	19
17 Strong's Hall, Tuckersmith Tp.	S. Huron	"	20
18 Bayfield, Public Hall	S. Huron	"	21

DIVISION 6. Dr. J. Standish, Walkerton; J. N. Paget, Canboro;  
Miss I. Rife, Hespeler, Feb. 1—9.

1 Princeton, Town Hall	N. Oxford	February	1
2 Drumbo, Town Hall	N. Oxford	"	2
3 Innerkip, Forester's Hall	N. Oxford	"	4
4 Cassel, Cheese Factory	N. Oxford	"	5
5 Hickson, Foresters' Hall	N. Oxford	"	6
6 Braemar, Town Hall	N. Oxford	"	7
7 Embro, Town Hall	N. Oxford	"	8
8 Thamesford, Foresters' Hall	N. Oxford	"	9
9 Crampton, Town Hall	E. Middlesex	"	11
10 Gladstone, School House	E. Middlesex	"	12
11 Wilton Grove, School House	E. Middlesex	"	13
12 Byron, Town Hall	E. Middlesex	"	14
13 Denfield, Town Hall	E. Middlesex	"	15
14 The Grove, School House	E. Middlesex	"	16
15 Thorndale, Hardie's Hall	E. Middlesex	"	18
16 Wellburn, German's Hall	E. Middlesex	"	19
17 Mt. Brydges, Town Hall	W. Middlesex	"	20
18 Appin, Town Hall	W. Middlesex	"	21
19 Wardsville Village, Town Hall	W. Middlesex	"	22
20 Glencoe, Town Hall	W. Middlesex	"	23

DIVISION 7. W. C. Shearer, Bright, Feb. 1—March 2; D. Johnson, Forest, Feb. 1—March 2.  
Miss B. Miller, Guelph, Feb. 1—14; Mrs. C. Campbell, Windsor, Feb. 28.

1 Corinth, Royal Templars' Hall	E. Elgin	February	1
2 Mount Salem, Royal Templars' Hall	E. Elgin	"	2
3 Sparta, Templars' Hall	E. Elgin	"	4
4 Mapleton, School House	E. Elgin	"	5
5 Middlemarch, Grange Hall	W. Elgin	"	6
6 Dutton, Town Hall	W. Elgin	"	7
7 Rodney, Township Hall	W. Elgin	"	8
8 Highgate, Township Hall	E. Kent	"	9
9 Ridgetown, Township Hall	E. Kent	"	11
10 Blenheim	E. Kent	"	12
11 Kent Bridge, R. B. Hall	E. Kent	"	13
12 Thamesville, Town Hall	E. Kent	"	14
13 Eberts, Township Hall	W. Kent	"	15
14 Tuppersville, Church Hall	W. Kent	"	16
15 Bear Creek, School House	W. Kent	"	18
16 Union, Union Hall	W. Kent	"	19
17 Wheatley, Gibson's Hall	W. Kent and S. Essex	"	20 & 21
18 Kingsville, Town Hall	S. Essex	"	22
19 Harrow, Town Hall	S. Essex	"	23
20 Amherstburg, Town Hall	S. Essex	"	25
21 Essex, Town Hall	S. Essex	"	26
22 School Section No. 8	N. Essex	"	27
23 Woodslee, St. Lawrence Hall	N. Essex	"	28
24 Comber, Town Hall	N. Essex	March	1
25 Tecumseh, St. Jean's Hall	N. Essex	"	2



SUPPLEMENTARY MEETINGS.—*Continued.*

DIVISION 8. E. C. Drury, Crown Hill, Feb. 1-25; A. E. Sherrington, Walkerton, Feb. 1-23;  
J. Buchanan, B.S.A., Guelph, Feb. 26—March 8; W. S. Fraser, Bradford,  
Feb. 25—March 8; Dr. Annie Backus, Aylmer, March 1-8.

1 Falkland, Hulbert Hall .....	S. Brant .....	February	1
2 Hatchley, School House .....	S. Brant .....	"	2
3 Cathcart, Foresters' Hall .....	S. Brant .....	"	4
4 Scotland, Foresters' Hall .....	S. Brant .....	"	5
5 Burtch, School House .....	S. Brant .....	"	6
6 Mt. Pleasant, School House .....	S. Brant .....	"	7
7 Caledonia, Association Hall .....	Haldimand .....	"	8
8 Canfield, McDonald's Hall .....	Haldimand .....	"	9
9 York, Town Hall .....	Haldimand .....	"	11
10 Clanbrassil, School House .....	Haldimand .....	"	12
11 Bingham Road, No. 3 School House .....	Haldimand .....	"	13
12 Rainham Centre, Town Hall .....	Haldimand .....	"	14
13 Fisherville, Town Hall .....	Haldimand .....	" 15 &	16
14 Cheapside, Town Hall .....	Haldimand .....	"	18
15 Nanticoke, Town Hall .....	Haldimand .....	"	19
16 Port Dover, Town Hall .....	S. Norfolk .....	"	20
17 Port Rowan, Town Hall .....	S. Norfolk .....	"	21
18 Fairground, Town Hall .....	S. Norfolk .....	"	22
19 Maybee, School House .....	N. Norfolk .....	"	23
20 Simcoe, Council Chamber .....	N. Norfolk .....	"	25
21 Tyrrell, Tyrrell Hall .....	N. Norfolk .....	"	26
22 Windham Centre, Town Hall .....	N. Norfolk .....	"	27
23 Kelvin, Kelvin Hall .....	N. Norfolk .....	"	28
24 Tillsonburg, Council Chambers .....	S. Oxford .....	March	1
25 Brownsville, Methodist Church .....	S. Oxford .....	"	2
26 Springford, Town Hall .....	S. Oxford .....	"	4
27 Burgessville, Oddfellows' Hall .....	S. Oxford .....	"	5
28 Oxford Centre, Town Hall .....	S. Oxford .....	"	6
29 Beachville, Town Hall .....	S. Oxford .....	"	7
30 Folden's, Folden's Hall .....	S. Oxford .....	"	8

DIVISION 9. E. Lick, Oshawa; R. S. Stevenson, Ancaster, Feb. 1-7, and Feb. 20—March 4;  
J. L. Hilborn, Leamington, Feb. 8-19; Miss B. Maddock, Guelph, Feb. 9-14;  
Miss A. Smith, Hamilton, Feb. 26.

1 Jerseyville, Waite's Hall .....	S. Wentworth .....	February	1
2 Carluke, School House .....	S. Wentworth .....	"	2
3 Glanford, Town Hall .....	S. Wentworth .....	"	4
4 Hannon, Hall .....	S. Wentworth .....	"	5
5 Binbrook, Town Hall .....	S. Wentworth .....	"	6
6 Tapleytown, Old Church .....	S. Wentworth .....	"	7
7 Winona, Institute Hall .....	S. Wentworth .....	"	8
8 Grimsby, Society Hall .....	Lincoln .....	"	9
9 Beamsville, Town Hall .....	Lincoln .....	"	11
10 Jordan Station, Town Hall .....	Lincoln .....	"	12
11 Grantham, Orange Hall .....	Lincoln .....	"	13
12 Virgil, Public Hall .....	Lincoln .....	"	14
13 Allanburg, Town Hall .....	Welland .....	"	15
14 Crowland, Town Hall .....	Welland .....	"	16
15 Welland, Court House .....	Welland .....	"	18
16 Stevensville, Jenson's Hall .....	Welland .....	"	19
17 Brown Road, School House .....	Welland .....	"	20
18 Humberstone, Town Hall .....	Welland .....	"	21
19 Dunnville, Town Hall .....	Monck .....	"	22
20 Marshville, Town Hall .....	Monck .....	"	23
21 Wellandport, Misener's Hall .....	Monck .....	"	25
22 Smithville, Brant's Hall .....	Monck .....	"	26
23 Lynden, Kivell's Hall .....	N. Wentworth .....	"	27
24 Sheffield .....	N. Wentworth .....	"	28
25 Kirkwall, School House .....	N. Wentworth .....	March	1
26 Carlisle, Orange Hall .....	N. Wentworth .....	"	2
27 Millgrove .....	N. Wentworth .....	"	4

SUPPLEMENTARY MEETINGS.—*Continued.*

DIVISION 10. D. Anderson, Orillia; Feby., 1—16; T. McMillan, Seaforth, Feb. 18—March 1; Miss Agnes Smith, Feb. 1, —9, 11, 14, 15; Miss B. Maddock, Guelph, Feb. 22.  
Miss G. Gray, Toronto, Feby., 26—Mar., 1

1 Wellesley, Opera House.....	N. Waterloo	February	1
2 Crosshill, Township Hall.....	N. Waterloo	"	2
3 Linwood, Spahr's Hall.....	N. Waterloo	"	4
4 Hawkesville, Powell's Hall.....	N. Waterloo	"	5
5 Heidelberg, Steiss Hall.....	N. Waterloo	"	6
6 Conestogo, Township Hall.....	N. Waterloo	"	7
7 Berlin, Library Hall.....	N. Waterloo	"	8
8 Bloomingdale, King Edward.....	N. Waterloo	"	9
9 Ayr, McGeorge's Hall.....	S. Waterloo	"	11
10 Branchton, Forester's Hall.....	S. Waterloo	"	12
11 Galt, Town Hall.....	S. Waterloo	"	13
12 Hespeler, Temperance Hall.....	S. Waterloo	"	14
13 Breslau, Old Church.....	S. Waterloo	"	15
14 Baden, Baden Hall.....	S. Waterloo	"	16
15 New Hamburg, Fell Hall.....	S. Waterloo	"	18
16 Philipsburg, Hall.....	S. Waterloo	"	19
17 St. Agatha, Hall.....	S. Waterloo	"	20
18 Mannheim, Hall.....	S. Waterloo	"	21
19 New Dundee, Hall.....	S. Waterloo	"	22
20 Roseville, Hall.....	S. Waterloo	"	23
21 Strasburg, Hall.....	S. Waterloo	"	25
22 Glenmorris, Hall (afternoon).....	N. Brant	"	26
23 Mau's School House (evening).....	N. Brant	"	26
24 Moyle's School House (afternoon).....	N. Brant	"	27
25 White School House (evening).....	N. Brant	"	27
26 Cainsville, Orange Hall.....	N. Brant	"	28
27 Langford, School House (afternoon).....	N. Brant	March	1
28 Mulligan's School House (evening).....	N. Brant	"	1

DIVISION 11. T. G. Raynor, Ottawa; J. W. Clark, Cainsville, Feb. 4—March 2; H. Glendinning, Manilla, Feb. 1—2; Dr. Annie Backus, Aylmer, Feb. 1—11; Miss I. Rife, Hespeler, Feb. 12—20.

1 Grand Valley.....	E. Wellington	February	1
2 Arthur, Town Hall.....	E. Wellington	"	2
3 Damascus, Township Hall.....	E. Wellington	"	4
4 Mt. Forest, Allan's Hall.....	E. Wellington	"	5
5 Cedarville, Orange Hall.....	E. Wellington	"	6
6 Farewell, School House.....	E. Wellington	"	7
7 Palmerston, Town Hall.....	W. Wellington	"	8
8 Rothesay, Temperance Hall.....	W. Wellington	"	9
9 Alma, Town Hall.....	W. Wellington	"	11
10 Commock, School House.....	C. Wellington	"	12
11 Ennottville, Mechanics' Hall.....	C. Wellington	"	13
12 Belwood, Town Hall.....	C. Wellington	"	14
13 Orton, Town Hall.....	C. Wellington	"	15
14 Erin, Town Hall.....	C. Wellington	"	16
15 Adjala, Sloan's Hall.....	S. Simcoe	"	18
16 Beeton, Town Hall.....	S. Simcoe	"	19
17 Thornton, Orange Hall.....	S. Simcoe	"	20
18 Everett, Orange Hall.....	W. Simcoe	"	21
19 Creemore, Leonard's Hall.....	W. Simcoe	"	22
20 Duntroon, S. O. S.....	W. Simcoe	"	23
21 Southampton, Grant's Hall.....	W. Simcoe	"	25
22 Nottawa, Orange Hall West.....	W. Simcoe	"	26
23 Oro Station, School House.....	E. Simcoe	"	27
24 Edgar, Temperance Hall.....	E. Simcoe	"	28
25 Price's Corners, Temperance Hall.....	E. Simcoe	March	1
26 Moonstone, Orange Hall.....	E. Simcoe	"	2

DIVISION 12. John Campbell, Woodville; J. G. Foster, Myrtle Station, Jan. 4—24; G. C. Caston, Craighurst, Jan. 25—Feb. 5; Miss S. Campbell, Brampton, Jan. 12 and 14; Miss I. Rife, Hespeler, Jan. 15—23.

1 Jessopville, Church Hall (afternoon).....	Dufferin	January	4
2 Riverview (evening).....	Dufferin	"	4
3 Honeywood, Chosen Friends' Hall.....	Dufferin	"	5
4 Horning's Mills, Workmen's Hall.....	Dufferin	"	7



SUPPLEMENTARY MEETINGS.—*Continued.*

5 Perm, Orange Hall.....	Dufferin.....	January	8
6 Relessey, Orange Hall.....	Dufferin.....	"	9
7 Glen Cross (afternoon).....	Dufferin.....	"	10
8 Camilla, Harshaw's Hall (evening).....	Dufferin.....	"	10
9 Laurel, Township Hall.....	Dufferin.....	"	11
10 Alton, Science Hall.....	Peel.....	"	12
11 Cheltenham.....	Peel.....	"	14
12 Brampton.....	Peel.....	"	15
13 Churchville.....	Peel.....	"	16
14 Malton, Temperance Hall.....	Peel.....	"	17
15 Tullamore, Town Hall.....	Peel.....	"	18
16 Mono Road, Society Hall.....	Peel.....	"	19
17 Bolton, Town Hall.....	Peel.....	"	21
18 Kleinburg, Temperance Hall.....	W. York.....	"	22
19 Maple, Masonic Hall.....	W. York.....	"	23
20 Elia, Forester's Hall.....	W. York.....	"	24
21 Islington, Township Hall.....	W. York.....	"	25
22 Laskey, Temperance Hall.....	W. York.....	"	26
23 Thornhill, Victoria Hall.....	E. York.....	"	28
24 Wexford, Methodist Church.....	E. York.....	"	29
25 Box Grove, Forester's Hall.....	E. York.....	"	30
26 Victoria Square, Public Hall.....	E. York.....	"	31
27 Schomberg, Temperance Hall.....	N. York.....	February	1
28 Kettleby, Temperance Hall.....	N. York.....	"	2
29 Mt. Albert, Town Hall.....	N. York.....	"	4
30 Sutton West, Sheppard's Hall.....	N. York.....	"	5

DIVISION 13. T. G. Raynor, Ottawa ; W. J. Lennox, B.S.A., Newton Robinson, Jan. 2—10 ;  
W. F. Stephen, Huntingdon, Que., Jan. 11—18 ; A. E. Sherrington, Walkerton,  
Jan. 19—29 ; Miss G. Grey, Toronto, Jan. 17,

1 Altona, School House.....	N. Ontario.....	January	2
2 Uxbridge, Town Hall.....	N. Ontario.....	"	3
3 Zephyr, Public Hall.....	N. Ontario.....	"	4
4 Udora, Orange Hall.....	N. Ontario.....	"	5
5 Cannington, Village Hall.....	N. Ontario.....	"	7
6 Beaverton, Alexander's Hall.....	N. Ontario.....	"	8
7 Brechin, McGrath's Hall.....	N. Ontario.....	"	9
8 Udney, Orange Hall.....	N. Ontario.....	"	10
9 Oakwood, Township Hall.....	W. Victoria.....	"	11
10 Little Britain, Temperance Hall.....	W. Victoria.....	"	12
11 Valentia, Temperance Hall.....	W. Victoria.....	"	14
12 Omemee, Opera House.....	E. Victoria.....	"	15
13 Dunsford, Old Church.....	E. Victoria.....	"	16
14 Cambray, Tamlin's Hall.....	E. Victoria.....	"	17
15 Burnt River, Orange Hall.....	E. Victoria.....	"	18
16 Bethany, Town Hall (afternoon).....	E. Durham.....	"	19
17 Manvers Station (evening).....	E. Durham.....	"	19
18 Millbrook, Town Hall.....	E. Durham.....	"	21
19 Cavanville, Old Church (evening).....	E. Durham.....	"	22
20 Garden Hill, Orange Hall.....	E. Durham.....	"	23
21 Canton, Sons of England Hall.....	E. Durham.....	"	24
22 Newtonville (afternoon).....	W. Durham.....	"	25
23 Newcastle (evening).....	W. Durham.....	"	25
24 Orono.....	W. Durham.....	"	26
25 Solina.....	W. Durham.....	"	28
26 Nestleton.....	W. Durham.....	"	29

DIVISION 14. J. W. Clark, Cainsville ; D. C. Anderson, Orillia, Jan. 4—30 ; J. W. Widdifield,  
Uxbridge, Jan. 31—Feb. 1 ; Mrs. Wm. Purves, Columbus, Jan. 11—21 ; Miss G. Gray,  
Toronto, Jan. 4, 9, 25, 26, 28, 29—Feb. 1.

1 Lakehurst, Town Hall (afternoon).....	W. Peterboro.....	January	4
2 Hall's Bridge, School House (evening).....	W. Peterboro.....	"	4
3 Selwyn, Temperance Hall.....	W. Peterboro.....	"	5
4 Ennismore, Town Hall.....	W. Peterboro.....	"	7
5 4th Line Smith, Orange Hall.....	W. Peterboro.....	"	8
6 Stewarts, Union Hall.....	W. Peterboro.....	"	9
7 Douro, St. Patrick's Hall.....	E. Peterboro.....	"	10

SUPPLEMENTARY MEETINGS—*Continued.*

8	Warsaw, Township Hall	E. Peterboro.	January	11
9	Havelock, Town Hall	E. Peterboro.	"	12
10	Westwood, Township Hall	E. Peterboro.	"	14
11	Consecon, Masonic Hall (afternoon)	Prince Edward	"	15
12	Wellington, Town Hall (evening)	Prince Edward	"	15
13	Demorestville, Town Hall	Prince Edward	"	16
14	Cressy, Town Hall (afternoon)	Prince Edward	"	17
15	Waupoos, Town Hall (evening)	Prince Edward	"	17
16	Milford, Town Hall	Prince Edward	"	18
17	Cherry Valley, Town Hall (afternoon)	Prince Edward	"	19
18	West Lake, School House (evening)	Prince Edward	"	19
19	Wooler, Town Hall	E. Northumberland	"	21
20	Brighton, Town Hall	E. Northumberland	"	22
21	Colborne, Temperance Hall	E. Northumberland	"	23
22	Castleton, Town Hall	E. Northumberland	"	24
23	Roseneath, Township Hall	W. Northumberland	"	25
24	Baltimore, Chapman's Hall	W. Northumberland	"	26
25	Bissells, School House	W. Northumberland	"	28
26	Columbus, Town Hall	S. Ontario	"	29
27	Whitby, Council Chambers	S. Ontario	"	30
28	Kinsale, Temperance Hall	S. Ontario	"	31
29	Greenbank, Temperance Hall	S. Ontario	February	1

DIVISION 15. W. F. Kydd, Simcoe, Jan. 3—Feb. 1; T. Mason, Straffordville; W. J. Kerr, City View, Feb. 2—7; Miss S. Campbell, Brampton, Jan. 22, 23, 25 and 28.

1	Bath, Town Hall	Lennox	January	3
2	Sillsville, Town Hall	Lennox	"	4
3	Adolphustown, Town Hall	Lennox	"	5
4	Odessa, Town Hall	Lennox	"	7
5	Wilton, Grange Hall	Lennox	"	8
6	Switzerville, School House	Lennox	"	9
7	Newburgh, Finkle's Hall	Addington	"	10
8	Centreville, Town Hall	Addington	"	11
9	Madoc, Town Hall	N. Hastings	"	12
10	Eldorado, Town Hall	N. Hastings	"	14
11	Marmora, Town Hall	N. Hastings	"	15
12	Ivanhoe, Orange Hall	N. Hastings	"	16
13	Moir, Town Hall	N. Hastings	"	17
14	Stirling, Foresters' Hall	N. Hastings	"	18
15	Turners' School House	W. Hastings	"	19
16	Harder's School House	W. Hastings	"	21
17	Gilbert's School House	W. Hastings	"	22
18	Foxboro, Friends' Hall	E. Hastings	"	23
19	Plainfield, Orange Hall	E. Hastings	"	24
20	Melrose, Town Hall	E. Hastings	"	25
21	Marysville, School House	E. Hastings	"	26
22	Clazie's School House	E. Hastings	"	28
23	Cataraqui, Township Hall	Frontenac	"	29
24	Glenburnie, Orange Hall	Frontenac	"	30
25	Sunbury, Township Hall	Frontenac	"	31
26	Sydenham, Township Hall	Frontenac	February	1
27	Piccadilly, Town Hall	C. Frontenac	"	2
28	Salem, School House (afternoon)	C. Frontenac	"	4
29	Fermoy, Town Hall (evening)	C. Frontenac	"	4
30	Newboro, Town Hall	Leeds	"	5
31	Delta, Town Hall	Leeds	"	6
32	Seeley's Bay, Select Knight's Hall	Leeds	"	7

DIVISION 16. C. W. Nash, 94 Lee Ave., Toronto, Jan. 3—30; A. C. Hallman, Breslau, Jan. 3—30; Dr. Annie Backus, Aylmer, Jan. 15—18.

1	Mallorytown, Odd Fellow's Hall	Brockville	January	3
2	Caintown, Pres. Church Vestry	Brockville	"	4
3	Addison, Ashwood Hall	Brockville	"	5
4	New Dublin, Township Hall	Brockville	"	7
5	Stone's Cors., E. Mc'Kim's Barn (afternoon)	S. Grenville	"	8
6	Stone's Cors., School House (evening)	S. Grenville	"	8
7	Charlesville, Jno. Carson's Barn (afternoon)	S. Grenville	"	9



SUPPLEMENTARY MEETINGS.—*Concluded.*

8	Maynard, Church Basement (evening).....	S. Grenville.....	January	9
9	Roebuck, R. Cornell's Barn (afternoon)....	S. Grenville.....	"	10
10	Roebuck, Orange Hall (evening) .....	S. Grenville.....	"	10
11	Ventnor, School House.....	S. Grenville.....	"	11
12	Shanley, Workman's Hall.....	S. Grenville.....	"	12
13	Mainsville, School House.....	S. Grenville.....	"	14
14	S. Mountain.....	Dundas.....	"	15
15	Winchester.....	Dundas.....	"	16
16	Winchester Springs.....	Dundas.....	"	17
17	Chesterville.....	Dundas.....	"	18
18	Moulinette, Church.....	Cornwall.....	"	19
19	Northfield, Arbuthnot's Hall.....	Cornwall.....	"	21
20	Apple Hill, Temperance Hall.....	Glengarry.....	"	22
21	Maxville, Public Hall.....	Glengarry.....	"	23
22	McCrimmon, Public Hall.....	Glengarry.....	"	24
23	St. Eugene, Town Hall.....	Prescott.....	"	25
24	Plantagenet, Town Hall.....	Prescott.....	"	26
25	Leonard, Town Hall.....	Russell.....	"	28
26	Russell, Town Hall.....	Russell.....	"	29
27	Casselman, Town Hall.....	Russell.....	"	30

## DIVISION 17. H. Glendinning, Manilla; R. S. Stevenson, Ancaster.

1	Toledo, Town Hall.....	N. Leeds and Grenville.....	January	3
2	Easton's Corners, Methodist Church.....	N. Leeds and Grenville.....	"	4
3	Bishop's Mills, Temperance Hall.....	N. Leeds and Grenville.....	"	5
4	Heckston, School House.....	N. Leeds and Grenville.....	"	7
5	Burritt's Rapids, Victoria Hall.....	N. Leeds and Grenville.....	"	11
6	North Gower, Town Hall.....	Carleton.....	"	12
7	Manotick, Harmony Hall.....	Carleton.....	"	14
8	City View, School House.....	Carleton.....	"	15
9	South March.....	Carleton.....	"	16
10	Stittsville, Harton's Hall.....	Carleton.....	"	17
11	Munster, Temperance Hall.....	Carleton.....	"	18
12	Glasgow, Davis Hall.....	S. Renfrew.....	"	19
13	Admaston, Temperance Hall.....	S. Renfrew.....	"	21
14	Scotch Bush, School House.....	S. Renfrew.....	"	22
15	Alice Tp., Cochrane's School House.....	N. Renfrew.....	"	23
16	Greenwood, Temperance Hall.....	N. Renfrew.....	"	24
17	Cobden, Town Hall.....	S. Lanark.....	"	25
18	Drummond, Town Hall.....	S. Lanark.....	"	26
19	Balderson, School House.....	S. Lanark.....	"	28
20	Harper, Town Hall.....	S. Lanark.....	"	29
21	Maberley, Town Hall.....	S. Lanark.....	"	30

## SPEAKERS AND SUBJECTS.

ANDERSON, DUNCAN C., Orillia.—Mr. Anderson, a native Scotchman, came to this country at an early age, and afterwards settled on a bush farm in Simcoe County, which he cleared with his own hands, and by dint of hard labor and well thought out plans, has succeeded in putting it into first-class condition. Mr. Anderson has paid special attention to the production of beef cattle and bacon hogs, and is an authority in the selection of heavy horses. He is a first-class judge of the classes of stock indicated in his list of subjects. Not only has he done regular Institute work in this Province for a number of years, but has been one of the Institute speakers sent out by the Dominion Department of Agriculture to do work in other Provinces, having visited all sections of the Dominion in which Institute work has been regularly done.

SUBJECTS: "Soil Cultivation and Rotation of Crops," "Clover as a Fertilizer," "Manure, its Care and Application," "Cattle Raising," "The Breeding of Heavy Horses," "Hog Breeding and Feeding," Evening: "Farming as an occupation."

ANNIS, L. E., Scarboro.—Mr. Annis was president of the East York Farmers' Institute for some time, and in this capacity, he and his secretary organized the Seed Fairs, which are now becoming general as an adjunct in Farmers' Institute work throughout Western Ontario. He is a good farmer, has a pleasing manner, is easy of speech, and makes a good impression on his audience. While Mr. Annis is not announced for many regular meetings, we are glad to have him on our reserve for most of the season.

SUBJECTS: "Production of Milk," "Pure and Impure Seeds of Weak Vitality," "Cultivation of the Soil, and the Eradication of Weeds," "Corn for the Silo," "Field Roots," "Growing Red Clover for Seed." Evening: "The Farmers' Honorable Calling," "Our Country."

BARBOUR, GAVIN, Crosshill.—Mr. Barbour has now had two years' experience as an Institute worker, and his services should prove of great benefit to the districts in which the production of beef and the cultivation of the soil are of importance. Mr. Barbour is a representative of a large number of farmers who have succeeded, by hard labor and a thorough knowledge of the lines of farming followed, in increasing the productivity of the farm and making many improvements, while at the same time paying off obligations. The young farmers should specially benefit from Mr. Barbour's addresses.

SUBJECTS: "Selection, Breeding and Feeding of Beef Cattle," "Cultivation of the Soil," "Care of Manure." Evening: "Farmers' Sons."

BECKETT, H. L., Hamilton.—Mr. Beckett is the son of a prosperous farmer in the vicinity of Hamilton. He spent his early years on the farm, and subsequently took a full course at the Ontario Agricultural College, graduating in 1893. Mr. Beckett has successfully managed the homestead, devoting a good deal of attention to the dairy industry. He had charge of one of the travelling dairies which toured the Province some years ago, and gave general satisfaction in conducting this educational campaign. He has already had extended experience in Institute work, and is quite at home in it. Mr. Beckett will be available for occasional meetings this winter.

SUBJECTS: "Farmyard Manure; its Management and Application," "Improving our Dairy Herds," "Feeding for Milk." Evening: "Farming as an Occupation."

BUCHANAN, J., B.S.A., Lecturer in Field Husbandry, Agricultural College, Guelph.—Mr. Buchanan is the son of a farmer and after spending his early years on the farm, took a course at the Agricultural College where he graduated some years ago. Since then most of his time has been spent in office and practical work in the experimental department with which he is now connected. Mr. Buchanan has had full charge of the Experimental Department and the lectures in Field Husbandry, in the absence of Prof. C. A. Zavitz during the past year. Mr. Buchanan is a recognized authority on the improvement of crops and the growing of grasses and alfalfa, and is a very pleasing and convincing speaker.

SUBJECTS: Afternoon: "The Improvement of Grain Crops," "The Work of the Ontario Experimental Union," "Pasture Land and Grasses," "Alfalfa." Evening: "The Secret of Nature Study," "Some Interesting Things about Farm Plants," "Student Life at the Ontario Agricultural College."

CAMPBELL, JNO., Woodville.—It is not necessary to more than mention that the John Campbell referred to is the well known sheep breeder who has been so successful, not only at Exhibitions in Canada, but also at the leading shows on the other side of the line. Mr. Campbell's specialty is sheep raising, and we also consider him one of the best authorities on general farming, and the production of beef.



SUBJECTS: "Growing Lambs for Profit," "The Butcher's Bullock, from Breeding to Block," "The Bacon Hog," "How to Double the Production and Income of the Average Farm," "Tile Draining," Evening: "Ontario, the Banner Province of the Dominion," "Farming as a Business."

CARLAW, GEORGE, Warkworth.—Mr. Carlaw is a good, practical farmer in Northumberland County. He attended the Ontario Agricultural College in his earlier years, and since then has been putting into practice on his farm the knowledge acquired in that institution. He is a practical dairyman, having served his time both in the home dairy and in the factory. Mr. Carlaw is also familiar with the practical work of the Farmers' Institute, having been secretary of his own for many years.

SUBJECTS: "Eradication of Weeds," "Dairying for Profit," "Corn for the Silo," "Cultivation of the Soil." Evening: "Education of the Farmer," "Butter making on the Farm."

CASTON, G. C., Craighurst.—Mr. Caston is past president of the Ontario Fruit Growers' Association and has charge of the Fruit Experiment station in Simcoe County. He is one of the oldest Institute workers, and is well and favorably known in this capacity throughout the Province. In addition to the subjects bearing directly on fruit, Mr. Caston is prepared to discuss cold storage, transportation, and marketing of products. He has probably done as much as any other man to introduce hardy fruits suitable to our northern districts.

SUBJECTS: "Succulent Foods and Fodder Crops," "Soil Problems and Nitrogen Traps," "The Export Bacon Trade," "Orchard Fruits of Ontario; their Care and Culture," "Some of our Troublesome Weeds," (illustrated). Evening: "Picking, Packing and Shipping Fruit," "The Fruit Garden," "The Land we Live in."

CLARK, J. G., Ottawa.—Mr. Clark has for many years been a prominent farmer in the vicinity of Ottawa and has given special attention to the production of milk for city trade. The dairyman who can successfully produce milk for this trade is in a position to give sound and valuable advice to patrons of the cheese factory and creamery as to methods of care and handling. Mr. Clark is also a recognized authority on heavy horses, and has been engaged during the past fall by the Provincial Department in taking a census of the horse industry of the province.

SUBJECTS: "The Breeding and Management of Heavy Horses," "The Judging of Dairy Cattle," "Grading up the Dairy Herd," "The Production and Handling of Milk," "The Cultivation of Roots and Ensilage," "Country versus City Life."

CLARK, J. W., Cainsville.—Mr. Clark is one of the largest breeders and feeders of poultry in the Province. He is a strong advocate of utility breeds for the farmer and approves of fattening chickens in crates. That he knows how to select the proper type for the best results is shown by the large number of prizes he has won on dressed poultry at the Winter Fair, Guelph. These prizes include the sweepstakes for the best pair in show. Mr. Clark is also a breeder of pure-bred hogs of the bacon type, has had several years experience in growing alfalfa, and has also a large apiary. Mr. Clark has given considerable attention to the production of good seed and methods of identification and eradication of weeds.

SUBJECTS: "The Importance of Seed Selection," "Noxious Weeds and Best Methods of Eradication," "Growing Alfalfa," "Feeding Hogs, Bacon Type vs. Short Fat," "Manure; its Care and Application," "Improvement of our Public Roads." Evening: "Poultry; Selecting, Breeding, Hatching, Rearing, Fattening," "Farmers' Poultry Houses and Fixtures," "The Incubator; Eggs in Winter," "Care of the Honey Bee."

DRUMMOND, D., Ottawa, 59 Waverley St.—Mr. Drummond is a noted breeder of Ayrshire cattle, is a successful dairyman and a good farmer. He has, therefore, the requisites of a good speaker. He also speaks French fluently, and so has been successful in sections of the Province where inhabitants do not speak English well. He uses charts as well as the stereopticon to illustrate his talks on the dairy cow. Mr. Drummond's services have been in demand in other Provinces, and he has spoken at Institute meetings and judged cattle at fall fairs from the Atlantic to the Pacific. Mr. Drummond is available for only occasional meetings this season.

SUBJECTS: "Selection, Breeding and Feeding of Dairy Stock," "Soil Moisture and Cultivation," "Care and Application of Manure," "The Importance of Selected Seed to the Farmer."

DRURY, E. C., Crown Hill.—Mr. Drury is an honor graduate of the O.A.C. and works successfully 150 acres, the farm upon which his father and grandfather lived. He is a fluent, forcible and convincing speaker and is well prepared to discuss the subjects for which he is announced. Mr. Drury is a good judge of live stock and a recognized authority on soil cultivation.

SUBJECTS: "Rotation of Crops, including Cultivation," "Weeds and how to Combat Them," "Soil Moisture and its Control," "The Farmers' Flock of Sheep," "The Breeding and Feeding of Beef Animals." Evening: "The Social Side of Farming."

EAGER, WM., Morrisburg.—Mr. Eager has large interests in dairying in the eastern part of the Province and his long practical experience places him in a position to give reliable information and sound advice to dairymen.

SUBJECTS: "The Duties of the Patron, Proprietor and Maker," "The Care of Milk on the Farm and in the Factory," "The Management and Care of Dairy Cattle." Evening: "The Advantages and Pleasures of Farm Life."

ECHLIN, J. H., Balderson.—Mr. Echlin has had extended experience in dairying so far as the making side of the problem is concerned. He has been one of the regular dairy syndicate instructors during the summer season for several years, and has also been one of the Dairy School Instructors at Kingston. When the Department was looking for a man to act as Dairy Sanitary Inspector last winter, they chose Mr. Echlin. He has spent the past summer in inspecting factories throughout Eastern Ontario with a view to inducing the proprietors and makers to keep their premises in a proper sanitary condition. From his wide experience in inspecting these factories as well as the farms of the patrons, Mr. Echlin's services should prove most valuable in the Dairy sections which he may visit.

SUBJECTS: "Sanitary Requirements of Cheese Factories," "Care of Milk for Cheese Factories," "Some of the Chief Requirements to Perfect the Cheese Products." "Duties of Patrons, Proprietors and Manufacturers."

ELLIOTT, ANDREW, Galt.—Mr. Elliott was born near Galt and has been a most successful breeder of dairy cattle and bacon hogs, for many years. He has retired from the management of his farm, his son William succeeding him in this. Mr. Elliott has been sought after by several States of the Union for Institute work, with the result that he has devoted very little time to the Ontario Institutes for several seasons. Mr. Elliott is one of our oldest Institute workers, and is enthusiastic, persevering, and extremely anxious for the success of every meeting he attends. His long experience as a successful farmer, and his ability to tell in an instructive and forcible manner just what he has accomplished, as well as the conclusions of others as to the most approved methods, renders him a valuable worker.

SUBJECTS: "Moisture and Fertility of the Soil," "The Benefits of Clover," "Clover Hay," "Roots Necessary to the Successful Handling of Live Stock," "Corn and Silage." "The Profits of Sheep," "The Modern Hog," "Breeding, Feeding and Caring for the Dairy Cow," "Principles of Stock Breeding," "Pure Seeds," "Concrete." Evening: "Our Duty."

ELLIOTT, WM., Galt.—Mr. Wm. Elliott is the son of Andrew Elliott. He attended the O. A. C., Guelph, and since graduation has been putting into practice the knowledge there gained. He has followed in his father's steps as a breeder of dairy cattle and bacon hogs, and has been a conspicuous prize winner at our large fairs. He is thoroughly practical and up-to-date in his methods of farming.

SUBJECTS: "The Cultivation of our Farms," "The Care and Breeding of Dairy Cows," "The Bacon Hog, Breeding and Feeding." Evening: "Things we ought to think about."

FOSTER, J. G., Myrtle Station.—Mr. Foster is managing the farm owned by Mr. F. W. Hodson, former Superintendent of Farmers' Institutes, and makes a speciality of dairying. Mr. Foster was secretary of N. Hastings for several years. His success in this office renders his services of special benefit to Institute officers in their local constituencies.

SUBJECTS: "Crop Rotation," "The Bacon Hog," "The Dairy Cow," "Our Fodder Crops." Evening: "The Land we Live in."

FRASER, W. S., Bradford.—Mr. Fraser is one of the pioneer Institute workers of Ontario. In the early days when Institute work was in its infancy he attended the meetings as the "practical" man, on deputations composed largely of college professors. He is a thoroughly practical farmer. He is well acquainted with most of the farm problems, and, having been over the entire Province of Ontario as well as in most of the other Provinces on Institute work, has become a valuable worker.

SUBJECTS: "Noxious Weeds and How to Deal with Them," "Seed Selection," "Clover and its Uses," "Sheep Management," "Bacon Hog," "Soil Cultivation; Underdraining," "Feeds and Feeding." Evening: "Home Life on the Farm," "Something Needful for Farmers," "A Trip in Eastern Canada."

GARDHOUSE JOHN, Highfield.—Mr. Gardhouse is a well-known breeder of shorthorn cattle and long wool sheep. All of the prize lists of our large fairs testify to his ability to raise high-class stock. He raises most of the food for his pure-bred stock, and is prepared to tell how he cultivates his land, plants his crops and mixes his foods so as to secure the best results from his live stock. Mr. Gardhouse will be found of special value to those Institutes where the officers wish to have practical work on heavy horses, beef cattle, or sheep.



SUBJECTS: "Horse Breeding for Profit," "Care and Management of Horses," "How to Select and Feed Beef Cattle," "Care and Management of Sheep," "Raising Feed for Live Stock." Evening: "How to Improve Present Farm Conditions," "How to Interest the Young People in the Farm."

GLENDINNING, HENRY, Manilla.—Mr. Glendinning, besides breeding and feeding dairy cattle, has made a reputation as a producer of field seeds. For years he has studied the weed question, and by practically eradicating the weed seeds from his fields has been able to produce a quantity of seed almost free from impurities. With his seed charts and talks on cultivation of the soil and rotation of crops, he has helped many farmers in Ontario to improve their methods of farming and to increase their profits. Mr. Glendinning is a most successful dairy farmer and a director of the Eastern Dairyman's Association.

SUBJECTS: "Feeds and Feeding," "Growing Clover and How to Save It," "Growing Red and Alsike Clover for Seed," "The Dairy Cow," "The Farm Water Supply." Evening: "Beautifying the Farm Home," "Farm Conveniences."

GROH, ANSON, Preston.—Mr. Groh has demonstrated how a very ordinary farm can be made a money-maker to its owner at the same time that the fertility is being increased and improvements laid for. Mr. Groh has given close attention to farm forestry, a subject of importance to Ontario farmers.

SUBJECTS: "The Farmers' Wood Lot," "Breeding, Feeding and Management of a Dairy Herd," "A Dairy Farm and a Farm Dairy," "Bacon Hogs," "Systematic Rotation of Crops," "Soil Moisture; Its Importance and Conservation," "Doubling the Revenue of the Farm in Five Years," "Clover and Lucerne." Evening: "The Stairway to Success," "The Farmer and the Sun," "Farming."

GROSE, HENRY, Lefroy.—Mr. Grose is the owner of a first-class farm in Simcoe County, and has been eminently successful in general farming. He has the happy faculty of presenting hard facts in a pleasing manner, and his address to boys on the farm is very instructive and uplifting. Mr. Grose has attended Institute meetings for two seasons with acceptance, and his services should be of special value in those sections where mixed farming is followed.

SUBJECTS: "How to Increase and Maintain the Fertility of the Soil," "Selection of Seed," "Home Dairy Work," "The Growing of Clover." Evening: "Making Farm Life Attractive for the Boy."

HALLMAN, A. C., Breslau.—Mr. Hallman is of German extraction and is located in a German settlement in the County of Waterloo. He is a well known breeder and feeder of dairy cattle, and for years has been a prize winner for hogs at the Toronto Industrial Fair. He has also judged at many of our fairs, including Toronto Industrial, hence his talk on the improvement of live stock has been well received by many farmers.

SUBJECTS: "How to Improve our Live Stock; their Care and Feeding." "The Bacon Hog and Export Trade," "Cultivation of Corn and the Silo," "Growing Sugar Beets for the Factory," "Home Dairying," "Noxious Weeds." Evening: "The Farmers' Fruit Garden," "Poultry on the Farm."

HOLTERMAN, R. F., Bradford.—Mr. Holterman has followed bee-keeping for a number of years and has been identified with the provincial organization as one of its officers from time to time. Mr. Holterman also gave instruction on this subject to the regular students at the Agricultural College for several years.

SUBJECTS: "Bee-keeping for the average Farmer," "The Life of the Honey Bee," "The Care of Bees."

HILBORN, J. L., Leamington.—For a long time the name of Mr. Hilborn has been familiar as one of the leading fruit growers in Lambton County. He owns a splendid fruit farm on the north shore of Lake Erie, which bears every evidence of thrift and prosperity. His buildings are neatly painted, and no weeds are allowed to grow to the detriment of the crops. A 6,000 gallon tank holds water which is used for irrigation.

SUBJECTS: "Growing Early Vegetables for Commercial Purposes," "Care and Cultivation of a Peach Orchard," "Cement for Building Purposes," "The Farmer's Fruit and Vegetable Garden."

HUME, ALEX., Menie.—Mr. Hume is a noted Ayrshire breeder in the County of Northumberland. He is also a noted prize winner at our fall fairs, and as he is well prepared to discuss the dairy herd from all standpoints, his services will be appreciated.

SUBJECTS: "Selection and Care of the Dairy Herd," "Rotation of Crops and Application of Manure," "The Bacon Hog." Evening: "Advantages of Farm Life."

JAMES, D., Langstaff.—Mr. James took possession of the farm on which he now resides some 34 years ago, and has succeeded in converting it from a bed of weeds and rubbish into a clean, systematic and well equipped farm. He is a believer in general farming, as will be seen from his list of subjects. Some 30 years ago Mr. James and his neighbors formed an association and held weekly meetings throughout the winter. At that time he began the collection of a library, and to-day has one of the best equipped agricultural libraries to be found among practical farmers.

SUBJECTS: "Destruction of Weeds," "Home Dairying," "Growing and Curing Alfalfa," "Corn for Ensilage," "The Farmers' Wood Lot." Evening: "Some Mistakes made by Farmers," "Hits and Misses."

JONES, HAROLD, Maitland:—For a long time it was thought that the St. Lawrence Valley would never become a fruit-growing district. Mr. Jones, however, has demonstrated to the contrary. He is one of the men who has made the apple, known as the "McIntosh Red," famous throughout the world. On his farm is located one of the Provincial Fruit Experiment Stations, and through this Mr. Jones has for years demonstrated to the farmers throughout the Valley the benefits to be derived from clean cultivation, proper fertilizing and persistent spraying. As the result of careful spraying Mr. Jones has raised large crops of fine potatoes, while those of his neighbors were ruined by rot.

SUBJECTS: "How to Manage our Fruit Orchards; Planting, Cultivating, Fertilizing, Harvesting, Packing, etc.," "Life History of some of our Troublesome Insects," "Spraying, and why we do it," "Potato Culture and Treatment for Blight and Rot." Evening: "The Balance of Nature, Bird Life and Insect World."

JOHNSON, D., Forest.—Mr. Johnson is a successful grower and shipper of apples and other large fruits and has a good practical knowledge of all lines of farming. He is specially interested in the co-operative production and marketing of fruit which has been carried on so successfully at Forest. This success has been due largely to Mr. Johnson's efforts.

SUBJECTS: Care and Cultivation of Fruit," "Insects and Fungi affecting Fruit and Trees," "The Spraying of Fruit," "Marketing and Shipping of Fruit," "Co-operation," "Fodder for Export Cattle."

KERR, W. J., City View.—Mr. Kerr has been an extensive grower of small fruits and vegetables for the past fifteen years, and has been able to keep in touch with the work along these lines at the Central Experimental Farm. Mr. Kerr has attended special series of orchard meetings, and his addresses to farmers in Eastern Ontario as to the possibilities of fruit growing should prove an incentive to them to go more largely into this profitable branch.

SUBJECTS: "Fruit and Vegetable Growing," "Decorating the Home Grounds," "Marketing of Fruits and Vegetables."

KLINCK, L. S., Ste. Anne de Bellevue.—Mr. Klink is a graduate of the Ontario Agricultural College and had had extensive experience in College work across the line. He is now one of the members of the regular staff of the Agricultural College at Ste. Anne de Bellevue. Mr. Klink has given special study to the improvement of farm crops, and his instructions as to the improvement and production of corn should be of value in the sections which he may visit.

SUBJECTS: Cultivating, Harvesting and Storing of Seed Corn," "Selecting, Grading and Testing Seed Corn," "Methods of Breeding Seed Corn for the Canadian Trade," "The Improvement of our Cereal Crops by Seed Selection," "The Seed Control Act," "Weeds and their Eradication."

KYDD, W. F., Simcoe.—Mr. Kydd talks on horses, dairy cattle and small fruits. He has had a large practical experience in all these departments, and being an aggressive, forceful speaker, his words carry weight. He has also had a wide experience in fair matters, having been superintendent of the horse department of probably the largest purely agricultural show in the Province. He is also a judge of both light and heavy horses, and, as such, has been invited to place awards in many parts of Ontario. He is one of our most acceptable Institute workers.

SUBJECTS: "Am I Raising the most Profitable Horse?" "The Dairy Cow; Her Summer Feed and Winter Care," "Small Fruits and Care of Grape Vines, Peach and Plum Trees," "Potato Spraying." Evening: "Dropped Stitches."

LAVERY, J. F., V. S., Sunderland.—Dr. Lavery is a Veterinary Surgeon of extended experience in the locality in which he lives. This practical experience, together with the fact that he has carried on farm operations during a good deal of the time that he was practicing, places him in a position to be of special value as an Institute worker. His addresses on live stock problems are very instructive and the boys and young men should not fail to hear them.

SUBJECTS: "The Comparative Anatomy of the Digestive Organs of Horses and Cattle, and Foods Suited to Each." "The Diseases of Brood Sows, and Simple Remedies." "Diseases



affecting the Young Colt, and Remedies." "Care of the Mare and Colt." Evening: "Examination of a Horse for Soundness," "The Jurisprudence of the Sale or Exchange of Horses."

LEE, ERLAND, Stoney Creek.—Mr. Lee has made his reputation as a practical dairy farmer. He is familiar with all kinds of farm work, as well as the manufacture of milk into butter. He practices soiling to a large extent with his cows. Having been secretary of South Wentworth Farmers' Institute for many years, he is in a position to give assistance and advice of value to officers.

SUBJECTS: "The Codling Moth and Apple Scab," "Conservation of Soil Moisture," "Breeding and Feeding of the Dairy Herd," "Care of Milk for the Factory and Creamery," "Home Dairying," "Treatment of Milk Fever," "The Silo," Evening: "Improvement by Selection."

LENNOX, W. J., B. S. A., Newton Robinson.—Mr. Lennox is the son of a successful farmer in the county of Simcoe, and has always taken an active interest in the work as conducted on his father's farm. He has taken special pride in the production of different kinds of fowl since he was a mere lad and has won many prizes at local exhibitions. Mr. Lennox lives in the midst of a section noted for the production of alsike and red clover, and has been successful along these lines for a number of years. The young men and women of the farm should be much benefited by what Mr. Lennox has to say, for although he is a comparatively young man, he has already shown what can be done by systematic study and close application.

SUBJECTS: "Sheep; Breeds and Management," "Poultry for the Farmer," "Growing and Harvesting of Alsike and Red Clover," "Rotation of Crops." Evening: "The Farmer's Garden," "Training of Young Horses."

LICK, ELMER, Oshawa.—Mr. Lick makes a specialty of fruit culture. He has had charge of a large orchard for a number of years, and when the Fruit Marks Act was passed by the Dominion Government he was one of the first inspectors to be appointed by the Dominion Department of Agriculture. In this capacity he has had opportunity of looking into all matters connected with the fruit industry, from the cultivation of the soil to the disposing of the products. He, therefore, speaks with authority, and can view the question both from the producers and commercial standpoint.

SUBJECTS: "The Production of Apples," "Marketing Apples," "The Uses of Cement about the Farm," "Growing Corn," "The Farmer's Garden."

MCCALLUM, J. M., Shakespeare.—Mr. McCallum is a graduate of the Ontario Agricultural College and has, since his graduation, been putting into practice with good effect the lessons learned in his course. Mr. McCallum has been a most acceptable judge at the fall fairs, and has done some local institute work. He is a forcible and convincing speaker.

SUBJECTS: "The Importance of Selecting good Seed Grain," "The Spring Treatment of Seed Grain for Prevention of Smut," "The Corn Crop,—Growing, Cultivating, Saving, etc.," "Clovers,—Their Place in Rotation, Cultivation, Saving, etc.," "The Draught Horse on the Farm." Evening: "The Problem of Keeping Ontario Boys and Girls on the Farm."

MCCREA, LIEUT. COL. D., Guelph.—It is not necessary to more than mention the name of Lieut. Col. McCrea, as he is well known to the great majority of farmers of the Province as a breeder of Galloway cattle. He is known in the vicinity of Guelph as an up-to-date and successful farmer. His addresses on stock and general farm practices should prove of value to the districts which he may visit.

SUBJECTS: "Beef," "Heavy Horses," "Sheep Raising," "General Cultivation," "Rotation of Crops," "Corn and the Silo," "Field Roots," "Forage Plants; with special reference to grasses and clovers."

MCMILLAN, THOS., Seaforth.—For many years Mr. McMillan has taken a deep interest in Institute work, being president of his local Institute at the present time. He is a practical farmer and makes a specialty of beef cattle and heavy horses. His advice on general farm practices is based upon years of successful experience and observation. His talk to young people is most inspiring and the young men especially cannot well afford to miss the opportunity of hearing him.

SUBJECTS: "The Heavy Horse; How to Breed and Feed," "Breeding and Marketing of Beef Animals," "Soil Cultivation and Crop Rotation." Evening: "The Demands of Canadian Agriculture," "A Talk to our Young People."

MCRAE, A. D., Maxville.—Mr. McRae is a practical farmer who has been closely identified with the dairy business for about thirty years. He has always kept a good working herd and has had the additional advantage of living near men who have been prominent in the produc-

tion of pure bred animals. The practical dairyman will find much of interest to discuss with Mr. McRae at Institute meetings.

SUBJECTS: "The Care of Milk, from the Cow to the Factory," "The Improvement of the Dairy Herd," "The Best Crops for the Dairy Farm."

MASON, T. H., Straffordville.—When the Ontario Agricultural College at Guelph first opened its doors to farmers' sons, Mr. Mason was one of the first to enroll. He spent two years at the institution at that time, and has been able, as a result of his college work, to put into practice on his own farm so many modern ideas and methods, that his neighbors have found his farm and farm work a constant inspiration to them. Mr. Mason makes a specialty of dairying, hog raising, and production of corn. He has kept in close touch with the work of the College through all the years and can give much of value regarding the work of that institution, as well as of the Experimental Union.

SUBJECTS: "Care and Food of Dairy Cattle," "Hog Raising," "Sheep Raising," "Corn for Silage," "Maintenance of Soil Fertility," Evening: "A Trip to the Maritime Provinces," "Changing Conditions of Ontario Agriculture."

MITCHELL, J. W., Superintendent Eastern Dairy School, Kingston.—Mr. Mitchell has been closely identified with the dairy interests of Ontario for some years. He acts as Superintendent of the Dairy School in the winter months, and in the summer instructs the creamery men throughout the eastern portion of the Province. Mr. Mitchell is well qualified to advise the farmers, proprietors and manufacturers with reference to the production and handling of milk, and the manufacture of the same. He is a clear and forcible speaker.

SUBJECTS: "The Cream Gathering Creamery," "Care of Milk for Cheese Factories and Creameries," "The Present Requirements of the Dairy Industry."

NASH, C. W., 94 Lee Ave., Toronto.—Mr. Nash has an international reputation on the subjects that embrace natural history. He has long been an authority on birds, and has written bulletins both for the Department of Agriculture and for the Department of Education on this important subject. His talks also deal with plant and insect life, as well as the rearing and breeding of domestic animals. Probably there is no one on the staff who can better interest young people at Institute meetings than Mr. C. W. Nash.

SUBJECTS: "How Plants Grow," "Breeding of Domestic Animals," "The Value of our Birds," "Our Insect Pests," "Nature about the Farm," "Farm Forestry."

ORR, J. E., Fruitland.—Mr. Orr lives on a 125-acre fruit farm, nearly every foot of which is devoted to fruit growing. Living, as he does, in one of the best sections of the Niagara District, and specializing as he does in the production of fruit, Mr. Orr has a technical knowledge, of this subject possessed by few men of his age. From the cultivation of the soil to the marketing of the fruit, he is familiar with every detail.

SUBJECTS: "Some Insect Enemies of the Orchardist," "Mistakes made in Spraying," "Notes on Plums," "Controlling the Codling Moth," "The Black Knot, and how we Exterminated it in our Township," "The Culture and Care of Fruit Trees," "Can we Overcome Off Years' in our Orchards?" "How and When to Prune."

PAGET, J. N., Canboro.—Mr. Paget is well known in dairy circles through his connection with the Western Dairymen's Association. He has been either director or President for a number of years, and is now a member of the Directorate. Mr. Paget is particularly well known in his own district for the aggressive and up-to-date methods he has adopted in conducting his dairy business. He is not only a thoroughly practical man, but is capable of presenting the results of his experience in a clear and forceful manner.

SUBJECTS: "Care and Production of Milk," "Profit and Loss in Dairying," "Handling the Finished Product until it Reaches the Consumer," Evening: "The Relation which should exist between Producer, Proprietor and Maker."

PEARCE, JOHN S., London.—The name of John S. Pearce is well known throughout Ontario, particularly in the West, as the head of a most reliable seed firm for many years. Some four or five years since Mr. Pearce gave up business to take charge of the parks and gardens and general horticultural work in London. He has had extended experience in Institute work, and his addresses on the selection of seed, planting of trees, etc., will be found very instructive.

SUBJECTS: "Selection, Care and Cultivation of Seeds," "School Houses and their Surroundings," "Planting of Trees for Ornament and Timber," "What, When and How to Plant," "The Farmer's Lawn and Flower Garden."

PEER, W. E. A., Burlington.—Mr. Peer is one of the best informed young fruit men in the southern part of the Province. He has had considerable experience in inspecting orchards, conducting spraying demonstrations, and superintending the fumigation of nursery stock. Mr. Peer has also lectured at Institute meetings with acceptance.

SUBJECTS: "Strawberry Culture," "Tomato Growing," "Plum Culture," "The Cherry," "A Young Man's Duty to Agriculture," "Ways and Means of Controlling Insect Life."



PUBLOW, G. G., Chief Dairy Instructor for Eastern Ontario, Kingston.—Mr. Publow is well known in the Province as the man who has done so much to improve the quality of cheese in the eastern sections of Ontario. He has been Chief Instructor since the syndicate system was inaugurated, and knows better than any other man the requirements of the different sections. His addresses upon the "Sanitary Requirements of Cheese Factories," and "The Production and Care of Milk upon the Farm" are presented in a forcible and convincing manner.

SUBJECTS: "The Production and Care of Milk in Cheese Factories," "The Importance of Properly Built, Well Equipped and Sanitary Factories," "Skill and Forethought Essential in the Manufacture of Cheese," "The Cheese Industries of the Dominion."

RAYNOR, T. G., B.S.A., Ottawa.—There will be few, indeed, of our readers who do not know Mr. Raynor. He has been in nearly every Institute district in Ontario, as well as in some of the States of the Union. He is a good speaker and is thoroughly familiar with his subjects. He is a graduate of the O.A.C., has been president of the Old Central Farmers' Institute, and has been identified with nearly every progressive agricultural movement in Ontario during the past twenty years. Mr. Raynor now has charge of the Ontario work under the direction of the Seed Division of the Dominion Department of Agriculture.

SUBJECTS: "Feeds and Feeding," (Illustrated) "Forestry," "Grading up a Herd or Flock," "Corn and Clover," "Soil Cultivation," "The Production of Pork," "Noxious Weeds and Methods of Destroying Them," "A Forward Movement in Field Agriculture," "How to Increase our Dairy Profits," "The Farmer and the New Seed Control Act." Evening: "Agricultural Development," "Mistakes in Farming."

REED, DR. HENRY G., Georgetown.—Having had a good practical farm training, and a thorough course in veterinary science, Dr. Reed is able to deal not only with the problem of breeding and feeding live stock, but can also discuss the question of "Domestic Animals in Health and Disease." Dr. Reed has been much in demand to judge live stock at fall fairs, and his Institute work has been entirely satisfactory and much appreciated.

SUBJECTS: Principles and Practice of Stock Breeding," "Horse Breeding for Profit," "Horse Breeding and Care in Relation to Diseases," "Diseases of Digestive System of Cattle," "Brood Mare and Foal."

RENNIE, SIMPSON, 454½ Ontario Street, Toronto.—The name of Rennie needs no introduction to the farmers of Ontario. Mr. Simpson Rennie was connected with the agricultural club formed in Scarboro Township, 35 years ago, and attributes much of his success to the knowledge gained from the papers and discussions given at the club long before the establishment of Farmers' Institutes. Mr. Rennie is one of the best authorities we have on all lines of general farming. His farm won the gold medal in the "Good Farms Competition" in Ontario in 1883.

SUBJECTS: "Is the Sugar Beet a Profitable Crop for the Farmer to Grow?" "Root Culture and Rotation," "Destruction of Weeds," "Selecting Cattle for Beef Production."

REYNOLDS, A. J., Scarboro Junction.—Mr. Reynolds is secretary of East York Institute. Besides the regular Institute meetings he and his fellow workers have held a series of special meetings conducted entirely by local talent, and without any assistance from the Department. The Annual Seed Fair of East York of which Mr. Reynolds is also secretary, has proved a very instructive line of work for the Institute members. Unfortunately Mr. Reynolds cannot conveniently leave home for a long trip, but we are glad to place his name on our reserve list.

SUBJECTS: "The Dairy Cow; her Care and Feed," "Corn and the Silo," "Clover Growing," "Objects and Methods of Cultivation." "Seed Fairs," "Sugar Beets."

SHAW, JOHN C., Norwich.—Mr. Shaw is a successful farmer in the county of Oxford, having removed from the county of Wentworth some few years ago. Since coming to South Oxford he has demonstrated that money can be made from a run-down dirty farm at the same time that it is being put in first-class condition. Mr. Shaw's advice on this line of work, as well as upon general farm topics, should prove of interest and benefit to the districts which he may visit.

SUBJECTS: "How to Increase the Production of the Average Farm," "The Buying and Building up of Run-down Farms as an Investment," "Rotation and Cultivation," "Social Conditions upon the Farm."

SHEARER, W. C., Bright.—Dairying is the particular department of farming in which Mr. Shearer has been eminently successful. He is thoroughly practical, a good speaker, an Institute man of experience for some years past, and is a most acceptable delegate. As will be seen from his subjects, Mr. Shearer is also prepared to discuss the bacon, seed and corn questions.

SUBJECTS: "Rotation of Crops and Selection of Seed Grain," "A Good Bacon Hog and its Feeding," "Selecting and Testing a Dairy Herd," "Production of Milk and its Care for the Factory," "Success in Growing Corn." Evening: "Profitable Farming," "Poultry Raising for the Boys," "Butter Making on the Farm."

**SHEPPARD, FRED. A., Queenston.**—Mr. Sheppard is a successful fruit farmer in the celebrated Queenston district. He has made a specialty of packing fruit in fancy boxes for the best trade. He has also been particularly successful in grafting and budding, and gives illustrations of both these methods of propagation at the meetings. He is also a producer of tomatoes, and talks tomato culture from the cold frame to the market.

**SUBJECTS:** "Propagation of Fruit Trees, Vines, Care of Orchards and Vineyards," "Clover, Corn and Roots," "The Importance of Soil Moisture and How to Conserve It," "Small Fruit for the Home Market," "Insects and Fungi Injurious to our Fruit Crop," "Weeds, and how to Destroy Them," "Some Advantages of Living on a Farm."

**SHEPPARD, MAJOR JAMES, Queenston.**—As the title would imply Major Sheppard has had a military record. As a defender of the country in 1866, he has a fund of historical knowledge that different Institutes have found useful for their evening meetings. His talk on "Three Historical Days on the Niagara River" has been as favorably commented on as any that have been delivered. His practical subjects deal with orchard management and good roads. With the latter movement he has been identified for many years. In 1902 he had charge of the Good Roads Movement in Eastern Ontario, and built roads in several townships as a guide to the municipal council for future work in road making.

**SUBJECTS:** "Planting and Care of Fruit Trees," "Propagating Fruit, Grafting, Budding, etc.," "The Spray Pump, when and how to use it," "Macadam Roads, Cost of Construction," "The Improvement of Country Roads," "Soil Tillage for Fertility and Moisture," Evening: "Opportunities on Canadian Farms," "Three Historic Days on the Niagara River."

**SHERRINGTON, A. E., Walkerton.**—Mr. Sherrington has charge of the Provincial Fruit Experiment Station for that district. He is well up in matters pertaining to fruit culture, and is known in the Lake Huron district as a "co-operative farmer," for he believes that "in union is strength." He is the manager of his local co-operative society, and handles most of the fruit shipped out of the town of Walkerton.

**SUBJECTS:** "Orchard Management," "Planting, Pruning and Grafting," "Spraying as a Preventive of Insects and Fungous Diseases," "Co-operative Marketing of Farm Products," "Conservation of Soil Moisture," "Selection of Seed Grain and the Eradication of Weeds," "The Importance of Uniformity, Quantity and Quality in Farm Products," (afternoon or evening). Evening: "The Farmer's Fruit Garden," "Breeding, Feeding and Marketing of Poultry," "Beautifying a Farm Home."

**STANDISH, DR. J., Walkerton.**—After a thorough training in practical work upon his father's farm in the County of Wellington, Dr. Standish took a course in veterinary science and followed that profession for some 25 years. He has done considerable Institute work in Ontario and the other Provinces of the Dominion during the past three or four years. He has been a prominent judge of live stock at fall fairs for the past 30 years. Dr. Standish is an authority on the subject of Horses, Beef Cattle, and Bacon Hogs, and is also prepared to discuss general farm management.

**SUBJECTS:** "Breeding of Horses," "Selection and Feeding of Beef Cattle," "Requirements of the Bacon Hog Industry," "Diseases of the Digestive System of Cattle," "Unsoundness in Horses and the Best Means of Detecting the Same." Evening: "Training of the Young Horse."

**W. F. STEPHEN, Huntingdon, Que.**—Mr. Stephen is widely known as a successful breeder of Ayrshire cattle, and has been sought after through the whole Dominion as a judge of dairy cattle. Mr. Stephen is the owner of a good working herd of pure breeds, and his address upon "The growing of crops suited to dairy cattle" and "The dairy cow" should prove of special interest in dairy sections.

**SUBJECTS:** "Soil and Tillage," "Corn and the Silo," "The Dairy Cow; How to Rear and Feed Her," "Good Roads and How to Make Them," "Keeping Farm Accounts and Records," "Stable Manure and Fertilizers." Evening: "How to interest the Boys and Girls in Farming," "Making the Most of Farm Life."

**STEVENSON, R. S., Ancaster,** is one of the oldest Institute workers in Ontario. Being a practical dairyman and breeder of dairy cattle, he has been identified with advanced dairy work in Ontario for a long time. During the past few years he has acted as judge of live stock at many fall fairs, and has given excellent satisfaction. No matter where he goes Mr. Stevenson is always welcome, and is recognized as a man who thoroughly understands the work he undertakes to discuss.

**SUBJECTS:** "A Practical Talk on Dairy Cows, Breeding, Feeding, Selecting, etc.," "Growing the Corn Crop and Handling it to the Best Advantage," "The Growing of Root Crops," "The Cream Separator on the Farm," "The Farm Water Supply."



**THOMPSON, ROBERT, St. Catharines.**—Mr. Thompson is a practical fruit grower, and has also had a wide experience in handling and shipping of fruit. He is also interested in the subject of cold storage, and has practically demonstrated the need for such an institution in a large fruit business. Mr. Thompson is also a practical farmer, and, in addition to his orchard work, raises large quantities of poultry and hogs.

**SUBJECTS:** "Poultry Raising," "Incubators and Poultry Houses," "Swine Breeding and Feeding," "Corn Growing," "Small Fruit and Fruit Trees," "Gathering and Marketing of Fruit," "Cold Storage," "Under-draining," "Cultivation of the Soil," "Good Seed, and Some of our Common Weeds, and How to Destroy Them." **Evening:** "The Farmer of the Future and his Prospects," "Poultry Raising for Boys and Girls," "Hints on Canning Fruits and Vegetables."

**WAGG, A. J., B.S.A., Mindemoya.**—Mr. Wagg is a graduate of the O.A.C., and a specialist in dairying. After graduation he moved to New Ontario, and has been doing pioneer work in dairying for some years past. He is the owner of a large creamery in Mindemoya, on Manitoulin Island, and it was because of his success in this work that he was chosen for the larger field of Institute work.

**SUBJECTS:** "Selection and Management of Dairy, Cattle, Calv Heifer, Cow," "Soil Fertility in Relation to Dairy Farming," "Milk; Secretion, Composition, Handling and Food Value." **Evening:** "Methods of Creaming Milk and Home Butter Making," "Agricultural Education," "Conditions in New Ontario for the New Settler."

**WARREN, J. L., Acton.**—Mr. Warren has had experience as secretary of Halton Institute, and it was due largely to his aggressive work that it became the banner Institute for Ontario some years ago. He is a thorough, practical farmer, and his addresses are interesting and instructive. Institute officers will find Mr. Warren competent to give them valuable information as to conducting local Institutes.

**SUBJECTS:** "Clover as a Feed and Fertilizer," "Corn and the Silo," "Breeding and Feeding of Beef Cattle," "Some Methods of Destroying Weeds." **Evening:** "How to Make our Institute Successful," "The Institute as an Education for Farmers' Sons and Daughters."

**WILSON, D. M., Kemptville.**—Mr. Wilson has been one of the regular dairy instructors for several seasons, and has given close study to the requirement of cheese factories and the care of milk upon the farm. One of the essentials in the production of high cheese or butter is that the raw material be properly looked after on the farm. Mr. Wilson will be able to give reliable advice and instruction on this point.

**SUBJECTS:** "Common Taints Found in Milk, and their Action in Cheese and Butter Making," "The Patron's Relation to the Factory," "Unnecessary Loss in Cheese-making," "Points to be looked for in a Dairy Cow," "Silos and Silage," "Co-operation in Dairying."

**J. W. WIDDIFIELD, Uxbridge.**—Mr. Widdifield is an associate of the O. A. C. and has, since his graduation, managed a farm successfully in Ontario county. Mr. Widdifield is much sought after to assist in local Institute work, and his success as a practical farmer has induced the Department to send him to a few regular meetings this year. After visiting the Northwest, Mr. Widdifield returns well satisfied with the conditions in Ontario, and should be able to state to the young farmers of this Province something which will be an incentive to them to put forth greater efforts to improve and extend their agricultural operation.

**SUBJECTS:** "Uses and Misuses of the Plow," "Soil Fertility, Increasing and Preserving Same," "Corn and Clover," "Destruction of Noxious Weeds."

**L. A. ZUFELT, Chesterville.**—Mr. Zufelt has long been identified with the cheese industry in Ontario, and has been employed on the staff of Dairy Schools, and as instructor in the summer months for a number of seasons. Mr. Zufelt certainly understands thoroughly the requirements in the manufacture of cheese, and his directions to the farmers as to the proper methods for the producing and handling of milk, should prove of great value to the sections which he may visit.

**SUBJECTS:** "Our Dairy Industry, Its present Conditions and Changes necessary for Its Improvement," "Sanitation of Cheese Factories and Farms," "Milk—Its Proper Treatment for Cheese Factories," "The Babcock Milk Test and its Use as a Basis of Payment for Milk."

#### LADY SPEAKERS.

**BACKUS, MRS. A. H., M.D., Aylmer.**—The Women's Institutes of Ontario are to be congratulated on securing the services of Dr. Annie Backus as one of its lecturers. Having been brought up on a farm, she is familiar with rural conditions, and knows the secrets of success. She is a keen observer, and a most acceptable speaker wherever she goes. Dr. Backus has addressed Institute meetings as a Departmental delegate with great acceptance for two years. She has had much to do with the success of the Institute at Aylmer West.

SUBJECTS: "Hygiene of the Home and Aids in Nursing," "Consumption and its Prevention," "The Importance and Meaning of Women's Work," "Training in the Home," "Education of Girls," "Poultry Raising," "The Horse: its Use and Abuse."

MRS. COLIN CAMPBELL, Box 517, Windsor.—Mrs. Campbell has been, until recently, secretary of the West Huron Women's Institute, and under her guidance it has become one of the strongest Institutes in the Province. She has also been an acceptable speaker at Farmers' Institute meetings, and a glance at her subjects will show that she is prepared to speak on many helpful phases of women's work.

SUBJECTS: "The Kitchen Garden—Does it Pay?" "The Housekeeper and Her Importance to the State," "Practical Housekeeping," "Food Values" (Demonstrations if desired), "Poultry Raising," "Canning Fruits and Vegetables."

MISS SUSIE CAMPBELL, Brampton.—Miss Campbell first attracted the attention of the Department by the success which attended her efforts in organizing branch Institutes and enthusing those already formed in the county of Peel. Miss Campbell attended Institute meetings in several ridings last summer, and her work was much appreciated by the officers and members of the various Institutes. Her addresses on "The Ideal Home" and "The Influence of Woman" are most edifying.

SUBJECTS: "The Ideal Home," "Grumblers and Critics," "A Young Lady's Accomplishments," "Our Fair Dominion," "The Influence of Woman." Demonstrations in Needlework.

MISS GERTRUDE CARTER, Guelph.—Miss Carter is a graduate of the Guelph Dairy School, and since her graduation has spent several seasons in her father's creamery at Aberfoyle. She is, therefore, prepared to speak on all questions pertaining to the handling of milk and the manufacture of butter. She is also a public speaker of ability. Besides the subject of dairying, Miss Carter is prepared to discuss the art of sewing, which is one of great importance.

SUBJECTS: "The Art of Sewing," "The Sunny Side of Dairying," "Kitchens—Past and Present." Evening: "The Modern Woman of the Farm." "Courtesy in the Home."

MISS BERTHA DUNCAN, Emery.—Miss Duncan is a graduate of the Hamilton School of Domestic Science, and has attended a number of Women's Institute meetings. She lives on a farm, and is familiar with the conditions surrounding rural life. The practical women of country, town, and village will appreciate the services of Miss Duncan.

SUBJECTS: "Economy in Small Things," (with demonstration), "Use of Food to the Body," "Selection and Care of Vegetables," "Salads," "Selection and Preparation of Foods," "The Relation of the Table to the Family," "Summer Desserts," (Demonstration).

MISS GERTRUDE GRAY, 650 Bathurst St., Toronto.—Three summers ago, during the special series of Women's Institute meetings, Miss Gray took her first trip on Institute work, and was well received in the different districts visited. She took a course in domestic science in Toronto, and at her own home puts into practice the knowledge gained while taking her college course.

SUBJECTS: "Dietetics," "Life's Talisman," "Science in the Home," "Twentieth Century Living."

Demonstrations in the following: "Meats and Fish," "Salads," "Puddings," "Eggs and Egg Dishes," "Cream Soups," "Tea Dishes."

MRS. ANDREW KINNEY, Grandview.—Mrs. Kinney is one of the most successful butter makers in Brant County. For a number of years she commanded the highest price for dairy butter in the Brantford market, and it was from the reputation made in this way that she became known to the Superintendent of Farmers' Institutes, and was induced to take a position on our staff. She makes a specialty of plain sewing, and her talks on "Fabrics" will, no doubt, be helpful and interesting to many women. Mrs. Kinney carries with her samples of flour, and tells how to judge it.

SUBJECTS: "The Fabrics we Buy, and Hints to Home Sewers" (Demonstrations in cutting), "Home-made Bread and the Flour we Use," "Home Butter Making," "Women's Institutes as Schools of Domestic Science," "Evenings at the Homestead" (evening), "The Modern Home."

DR. HELEN MACMURCHY, 133 Bloor St., E., Toronto.—Dr. MacMurchy's professional duties prevent her from devoting much time to Women's Institutes. The limited time which she gives to the work is much appreciated by the districts visited, and her pointed and enthusiastic addresses on the topics mentioned are well received.

SUBJECTS: "Twentieth Century Health Problems," "Health and the House," "The Health of Women and Girls," "Accidents and Emergencies," "Disease Germs," "Tuberculosis," "Patent Medicines," "The Day's Work."



MRS. D. McTAVISH, North Bruce.—Mrs. McTavish might be called one of the pioneers of West Bruce. As soon as Women's Institutes were mentioned she was one of the first to see the possibilities of such an organization for women on the farm. Since then she has been indefatigable in her efforts on behalf of the farmers' wives and daughters of her own district. She has also found time to help in provincial work, and none of our speakers have been more acceptable to the Women's Institutes of Ontario than Mrs. McTavish.

SUBJECTS: "Bread Making," "Home Dairying," "Kindness and Economy in the Home," "Home Economies," "The Education of our Daughters," "Care and Training of Children," "Means of Preserving Health" (evening).

MISS BLANCHE MADDOCK, Guelph.—Miss Maddock started in Farmers' Institute work before Women's Institutes were organized, so that she is thoroughly familiar with all branches of the work. Being a graduate of the Guelph Dairy School, and a student of bacteriology, she has a fund of useful information, and is always welcomed by her audiences. She has probably organized more Women's Institutes in Ontario than any other one person, and has shown herself an expert in getting into the hearts of the people, and getting them to work. Wherever Miss Maddock has gone there have been requests that she should return to the same district.

SUBJECTS: "Science and Butter Making," "Bread Making," "Our Women's Institutes and How to Make Them Interesting," "Bacteria; Their Relation to Health and Disease," "Different Cuts of Meat, Their Selection and Preparation," "Hygienic and Economic Values of Food," "Simple Home Remedies Without Recourse to the Patent Medicine Man or the Doctor," "A Girl's Possibilities."

MISS BELLA MILLAR, Guelph, Ont.—Miss Millar was for two years instructor in the Home Dairy Department of the Strathroy Dairy School. There she had an opportunity of helping the farmers' daughters to become familiar with the proper care and handling of milk and its manufacture into butter. During the last four years Miss Millar has turned her attention to Institute work, and, having had training in hospital nursing as well as in dairying, she is well up on two subjects which are always interesting to an Institute audience.

SUBJECTS: "Home and School," "School Luncheons," "The Reason Why in Butter Making," "Profit and Loss on the Dairy Farm," "Health in the Home," "Hints for the Home Nurse," "Domestic Education."

MISS ISOBEL MURRAY, St. Thomas.—Miss Murray is a graduate of the School of Domestic Science, and has had considerable experience in instruction work, as well as addressing Women's Institutes. Her demonstrations are very practical, and she has the faculty of instructing her audiences in food values, etc., at the same time that she is demonstrating.

SUBJECTS: "Hygiene in the Home," "Planning and Decorating of the Home," "Woman as a Home Maker," "Educating the Children."

Demonstrations and recipes on the following: "Salads," "Soups," "Egg and Cheese Dishes," "Left-overs," "Beverages and Sandwiches," "Cold Desserts," "Meat and Fowl."

MISS ISOBEL PEASE, 25 Bernard Ave., Toronto.—Miss Pease is a graduate in Domestic Science from the MacDonald Institute, and attended Institute meetings last summer with much acceptance to the members. Her demonstrations in remodelling hats and in the cutting and fitting of shirt waists were very much appreciated.

SUBJECTS: "Hygiene, Ventilation and Sanitation," "Foods; the Choosing of a Diet," "Hints on Home Nursing."

Demonstrations in the following: "Cream Soups," "Meats," "Eggs and Milk," "Summer Desserts," "Remodelling of Hats," "Cutting and Fitting of Shirt Waists."

MRS. LILLIAN GRAY PRICE, 650 Bathurst St., Toronto.—Mrs. Price is a graduate of the School of Domestic Science at Toronto. Besides her regular talks on home and home-making, she is prepared to give practical demonstrations on the preparation of foods for the table. She also advocates a liberal diet of fruit, and her talk on "The Value of Fruit in our Diet" has been well received in the Institutes she has visited. We are pleased to be able to count on Mrs. Price for occasional meetings throughout the season, as the services of so acceptable and successful a demonstrator and lecturer cannot well be spared from the ranks of the Institute staff.

SUBJECTS: "The Value of Fruit in our Diet," "Foods" (illustrated by charts), "Meats" (illustrated by charts), "Domestic Science on the Farm," "Making Home Attractive," "Every Man the Architect of His Own Fortune."

MRS. WM. PURVES, Columbus.—Mrs. Purves has taken a deep interest in the Women's Institute of South Ontario since its organization, and it is largely due to her efforts that the work in that riding has progressed so favorably. Her experience as an officer, and the very practical addresses which she gives, make her a most acceptable delegate.

SUBJECTS: "Preserving and Canning," "Household and Family Sewing," "Home," "Child Culture," "Consumption—Some Preventatives."

MISS LULU REYNOLDS, Scarboro Junction.—Miss Reynolds is a daughter of one of our most energetic Farmers' Institute secretaries, and she herself has been secretary of the East York Women's Institute for some years. Miss Reynolds is a most enthusiastic worker, and her addresses upon the subjects announced are well received.

SUBJECTS: "Hygiene and Sanitation," "Foods; their Different Constituents," "Horticulture," "Character Building."

MISS ISOBEL RIFE, Hespeler.—Three years ago Miss Rife proved one of the most acceptable delegates to Women's Institutes, although it was her first experience in work of this kind. Previous to going out Miss Rife took a course in the MacDonald Institute at Guelph, and before that was a successful public school teacher. As well as being a capable and pleasing speaker, Miss Rife created a favorable impression in many places by her gift of song.

SUBJECTS: "Helpfulness in Women's Institutes" (afternoon only), "Sunshine, Pure Air and the Bath" (afternoon only), "Consumption—Education, Prevention and Cure," "The Value of Physical Development," "The Home in its Attitude to the School," "The Hygiene of Cheerfulness," "Education for Girls."

MISS LAURA ROSE, Guelph.—Miss Rose is well and favorably known to most agricultural audiences of the Province of Ontario. She has charge of the Home Dairy Department at the Agricultural College, and has in the Guelph Dairy instructed thousands of farmers' daughters in the art of butter making. In the November-December series each year Miss Rose lends her services to Institute work, and occasionally during the winter, as she can be excused from her college work. For three years Miss Rose had charge of the Travelling Dairy in Nova Scotia, with marked success.

SUBJECTS: "How to Make the Dairy bring in Larger Profits," "Defects we find in Butter; their Cause and Remedy," "Cheese; its Food Value and Simple Recipes," "Bread and Buns," "As Others See Us," "The Womanly Sphere of Woman," "The Head, the Hand, the Heart; the Tripod of Successful Work."

MISS LILLIAN SHEFFIELD, 139 Havelock St., Toronto.—Miss Sheffield is a Normal graduate, and has taken a year's instruction in the Toronto Technical School. She is also a graduate of the MacDonald Institute at Guelph, and attended a series of Institute meetings in June last. Her addresses on food subjects and demonstrations in "Renovating of Hats" and "Cutting and Fitting of Shirt Waists" have proved of much interest.

SUBJECTS: Cooking Demonstrations, "Invalid Cookery," "Puddings," "Soups," "Renovating Hats and their Trimming" (Demonstrated), "Hints for the Home Dressmaker" (Demonstrated), "Hints on Home Nursing" (Demonstrated), "Dressing as an Art" (Demonstrated), "Food and its Functions," "Health and Economy in the Home," "Methods of Cutting and Fitting Waists and Skirts."

MISS L. SHUTTLEWORTH, Guelph.—Miss Shuttleworth was born and brought up on a farm, and is familiar with the conditions surrounding Ontario farm life. Since graduation from Guelph Dairy School several years ago she has had extended experience in dairying and other lines which fit her particularly well to address Farmers' and Women's Institute meetings. Miss Shuttleworth has proved an acceptable delegate to Women's Institute meetings the last three seasons.

SUBJECTS: "Cold Dishes for Summer Use," "Fruits; Methods of Canning, Preserving, etc.," "Short Talks and Discussions on Cream Separators, Dairy Utensils and their Care, Churning, Care of Milk and Cream," "The Needs of the Dairy Industry," "Evenings at the Homestead."

MISS AGNES SMITH, Hamilton.—Miss Smith graduated from the Ontario Normal School of Domestic Science, Hamilton. She has been connected with Women's Institute work almost since its organization, and her practical demonstrations have helped thousands of women in Ontario on their farms. She is a graduate of the Dairy School at Guelph, and had charge of the domestic science and home dairy work at the Western Dairy School, Strathroy, for two seasons. Miss Smith is one of the most efficient workers sent out by the Department.

SUBJECTS: "Principles of Cooking" (Demonstrated), "Meats; Composition and Cooking," "Food in its Relation to the Body," "Domestic Science," "The Sanitary Home," "The Needs of the Home of the Present Day," "Labor Problems of the Household," "The House; its Furnishing and Decoration," "A Plain Talk with Housekeepers."

MISS M. STEWART, 3 Washington Street, Toronto.—Miss Stewart has taken the full course in Domestic Science at the Lillian Massey School, and is now in her final year for the degree of B.A. in the University of Toronto. Miss Stewart attended Institute meetings last summer with much acceptance. She is a good demonstrator and a forcible and clear speaker.



SUBJECTS : "The Need for Variety in our Diet," "Some Necessary Precautions Against Disease" (evening), "Selection and Care of our Food," "A Girl's Education" (evening).

Demonstrations in the following : "Soups," "Egg, Cheese and Milk Dishes," "An Invalid's Tray," "Beverages and Sandwiches," "Cool Dishes for Summer Use."

MRS. HELEN WELLS, Syracuse, N. Y.—Mrs. Wells has attended Institute meetings in Ontario during the past two seasons, and her addresses on the subjects announced are most entertaining, instructive and convincing. The Department of Farmers' Institutes for New York State has engaged Mrs. Wells to conduct a series of Institute meetings for women in October and November, 1906. Mrs. Wells will be available for meetings in the summer of 1907.

SUBJECTS : "Home Hints," "What Shall the Child Read?" "Flowers for Busy People," "Sense and Nonsense," "The Value of Nature Study," "Roots or Branches, Which?" "The Air we Breathe?"

## INFORMATION FOR OFFICERS AND DIRECTORS.

The large body of directors of Ontario Farmers' Institutes are conversant with the "Act, Rules and Regulations," relating thereto. It has been thought well, however, to reprint herewith portions of the same as well as some additional information of particular value in making arrangements for, and carrying out, the programme of winter meetings.

While the Executive Committee of each Institute, composed of the President, Vice-President and Secretary-Treasurer, must be entrusted with the carrying out of most of the details of the work, the individual director has a responsibility in conferring with the other directors, as to the general policy for the riding and in giving advice as to the subjects which should be taken up at the meeting or meetings in his locality. The director for a locality is considered as a member of the executive in making arrangements for his local meeting and in carrying out the same. Upon receipt of this volume, each director should look up the subjects announced for the speakers who will visit his locality, make a selection of those topics which will be of greatest interest in the community and notify the secretary accordingly. He should also give assistance in securing a suitable hall in which to hold the meeting. If arrangements can be made for the use of live stock in giving instruction upon the different class of animals, the meeting is sure to prove of great interest. The directors should also give personal invitations to their neighbors who do not usually take an interest in the meetings. A note to the local paper and signed by the local director will have the effect of creating an increased interest.

### PRESIDENT.

It shall be the duty of the president to preside at all meetings of the board of directors and of the executive committee. In the absence of the president, the vice-president shall preside, and if both are absent a chairman shall be appointed by the committee.

The president should also be present at all Institute meetings, and preside at the same, or arrange with a local director to do so.

### SECRETARY.

The secretary, as managing-director of the Institute, has, of course, to shoulder the responsibility and do by far the greater portion of the work. Each secretary should have a copy of "Act, Rules and Regulations," at hand at all times and consult the same frequently. Copies will be furnished to officers and directors upon application.

Below is given some general information of interest to all officers and directors:—

### ADVERTISING.

Do not, in any case, announce all the subjects upon which a speaker is capable of giving an address without indicating those which have been chosen for each meeting, or stating clearly that the audience will be given an opportunity of selecting one or two subjects from the list. An Institute delegate is not supposed to give an address upon more than one subject at any one session, although under special circumstances he may give a ten-minute talk upon a second subject for the purpose of introducing a discussion.

Every meeting of an Institute, except the annual meeting, should be advertised by issuing posters, not less in size than 15x20 inches, on which should be printed an attractive programme of the meeting, giving date and place of meeting, hour of opening, etc. A copy of said bill should be sent at least two weeks previous to the



date of meeting to each postmaster, each schoolmaster, each miller, each blacksmith, and to other places of public resort in the district, which are within a radius of ten miles of the place of meeting, with a request to post in a conspicuous place. It shall be the duty of the officers and directors to exercise diligence to ensure the proper posting of the said bills. In addition thereto, a programme or handbill of convenient size, containing similar information, should be distributed so as to reach its destination at least one week previous to date of meeting. A copy of said programme should be sent to each member of the Institute, to farmers, journalists, public men and others in the district who reside within ten miles of the place of meeting. Such posters and programmes should announce that all interested are welcome, whether members of the Institute or not. Copies of said programmes should be sent to the school teachers in the district, with the request that they be carefully distributed among the children.

#### FURNISHING OF HALL.

A suitable hall should be secured at each place of meeting, and the local director should make it his special business to see that the hall is in readiness, and properly heated, at least half an hour before the time of meeting. If provision could be made to hold the afternoon session in such a place that live stock could be utilized in illustrating the remarks of the lecturer, it would be found to materially add to the interest and profit of the meeting.

#### COMMENCE MEETINGS ON TIME.

We trust that Institute officers and directors will make a special effort to get the people to the meetings on time. It is a matter of general regret on the part of Institute lecturers that the audience is usually late in reaching the place of meeting. This, of course, detracts from the effectiveness of the work, as many of the farmers in attendance require to go home between the afternoon and evening sessions, and any delay at the beginning means so much time taken from the session. A Question Drawer at the beginning of the session, based upon the topics announced for the speakers, is advisable. It is well to have strips of paper handed to the audience as they arrive at the hall, and when the hour for the opening of the meeting has arrived they should be collected and handed to the head of the deputation. A Question Drawer for a half hour, or even longer, at the evening session is a profitable way of filling in the first part of the programme while the late comers, and there are always sure to be some, are arriving.

Each deputation will be furnished with more or less illustrative material, and this will usually be on exhibition at the beginning of the session and will be found of much interest by the majority of the audience.

#### CONFERENCE OF INSTITUTE LECTURERS.

At the Institute Conference to be held in November, the speakers will derive much benefit from conversing with each other, and in hearing matters of general interest regarding Institute work discussed. The lecturers will also be furnished with considerable illustrative material, and will go to their work better equipped than ever before for the duties at hand.

#### FARMERS' INSTITUTE CLUBS.

We trust that many of the Institutes will form local clubs for the study and discussion of subjects which are of interest to the farmers. A number of these clubs

were formed last winter and for the most part the work undertaken has proved of great interest and benefit. Below is given

SUGGESTED RULES AND REGULATIONS FOR THE FORMATION AND CONDUCTING OF FARMERS' INSTITUTE CLUBS.

(1) The organization of a Farmers' Institute Club may take place at a regularly called Farmers' Institute meeting or at a meeting called for the special purpose. At least two weeks' notice of a specially called meeting must be given in the local papers or by poster; and all members shall be constituted members of the Farmers' Institute for the riding by paying the annual fee of 25 cents; said fee, with name and address, to be sent to the secretary of the Riding Institute. By the consent of the District Executive, five or ten cents per member may be retained for local purposes. Only members will be allowed to hold office or have a vote in elections. All farmers will be made welcome to meetings and have a voice in discussions.

(2) Those in attendance at the organization meeting should appoint a President, Vice-President, Secretary-Treasurer, and a committee of four or more. The committee should consist of about an equal number of old and young men. At each meeting one of the committee should drop out and be replaced by one elected by the meeting.

(3) The president shall preside at all meetings; in his absence the vice-president; in the absence of both, the members in attendance shall choose a chairman from among themselves (a member of the committee preferred).

(4) The committee shall arrange for the hour and place of each meeting, subjects to be discussed, speakers, etc. It would be well to have subjects to be taken up from time to time approved of by the meeting.

(5) Any expense incurred in providing a suitable place of meeting shall be covered by a collection; or, preferably, an additional fee, in case the proportion of regular fee retained does not cover expenditure.

(6) The proceedings of each meeting shall be recorded by the secretary, and a report of membership and other items of interest sent to the secretary of the Riding Institute at least every three months.

(7) No subject shall be presented at a Club meeting, or discussion allowed, of a political or sectarian nature.

(8) It would be well to make provision at some of the meetings, if not all, for recitations or music, to occupy a limited portion of the time.



KEY TO REGULAR AND SUPPLEMENTARY MEETINGS TO BE HELD BETWEEN  
NOVEMBER 26TH, 1906, AND MARCH 8TH, 1907.

R : Regular Meetings. S : Supplementary Meetings.

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# FARMERS' INSTITUTES OF ONTARIO.

## OFFICERS FOR 1906-07.

Institute.		Name.	P.O. Address.
Addington	President	Smith Gilmore	Tamworth.
	Vice-President	Geo. Anson Aylesworth	Newburgh.
	Sec.-Treas.	J. B. Aylesworth	Newburgh.
Algoma, C.	President	John Harris	Sault Ste. Marie
	Vice-President	Henry Knight, Jr.	Sault Ste. Marie
	Sec.-Treas.	Geo. H. Farmer, Box 59	Steelton.
Algoma, E.	President	S. C. Gardner	Iron Bridge.
	Vice-President	R. C. McDougal	Goldenburg.
	Sec.-Treas.	Thomas Cordukes	Sowerby.
Amherst Island.	President	Henry Filson	Stella.
	Vice-President	Robt. Kilpatrick	Stella.
	Sec.-Treas.	W. P. Tugwell	Stella.
Brant, N.	President	Jas. Pate	Brantford.
	Vice-President	W. C. Good	Brantford.
	Sec.-Treas.	J. W. Clark	Cainsville.
	Asst.-Sec.	A. W. Vansickel	Onondaga.
Brant, S.	President	H. MacMalcolm	Scotland.
	Vice-President	J. Harris Wooley	Burford.
	Sec.-Treas.	pro. tem., the President.	
Brockville	President	Wm. Stafford	Lyn.
	Vice-President	Wm. Steacy	Athens.
	Sec.-Treas.	R. H. Field	Brockville.
Bruce, C.	President	W. R. McDonald	Ripley.
	Vice-President	T. H. Purdy	Glamis.
	Sec.-Treas.	R. J. Nelson, V.S.	Paisley.
Bruce, N.	President	Cecil Swale	Warton.
	Vice-President	Wm. Laidlaw	Lion's Head.
	Sec.-Treas.	Peter Anderson	Hepworth.
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	Vice-President	W. H. Arkell	Teeswater.
	Sec.-Treas.	Jas. A. Lamb	Walkerton.
Bruce, W.	President	P. Cummings	Pt. Elgin.
	Vice-President	Jas. Rushton	Elsinore.
	Sec.-Treas.	J. H. Wismer	Pt. Elgin.
Carleton.	President	J. C. Bradley	Hazeldean.
	Vice-President	J. E. Caldwell	City View.
	Sec.-Treas.	R. H. Grant	Hazeldean.
Cornwall	President	W. J. Johnston	Cornwall Centre.
	Vice-President	Jas. McLeod, Jr.	Cornwall.
	Sec.-Treas.	C. W. Young	Cornwall.
Dufferin	President	John Prior	Jessopville.
	Vice-President	Geo. Best	Whitfield.
	Sec.-Treas.	Wm. Shields	Shelburne.
Dundas	President	A. D. Harkness	Irena.
	Vice-President	Arthur Christie	Winchester.
	Sec.-Treas.	J. P. Fox	Winchester.
Durham, E.	President	T. A. Kelly	Millbrook.
	Vice-President	David Sutton	Millbrook.
	Sec.-Treas.	A. J. Fallis	Millbrook.
Durham, W.	President	John Stewart	Kendal.
	Vice-President	A. C. Allen	Bowmanville.
	Sec.-Treas.	H. C. Hoar	Hampton.
Elgin, E.	President	W. B. Roberts	Sparta.
	Vice-President	Jas. Sheppard	Mt. Salem.
	Sec.-Treas.	F. Leeson	Aylmer.
Elgin, W.	President	T. N. Havens	Aldboro.
	Vice-President	John McFarlane	Dutton.
	Sec.-Treas.	Arch. McColl	Aldboro.
Essex, N.	President	O. J. Willcox	South Woodslee.
	Vice-President	S. Ducharme	Belle River.
	Sec.-Treas.	D. Ure	Windsor.

OFFICERS FOR 1906-7.—*Continued.*

Institute.		Name.	P.O. Address.
Essex, S.	President	Theodore Brunner	Kingsville.
	Vice-President	Philip C. Fox	Ruthven.
	Sec.-Treas.	G. W. Coatsworth	Kingsville.
Frontenac	President	J. B. Quinn	Dufferin.
	Vice-President	Byron Gordon	Glenvale.
	Sec.-Treas.	Joshua Knight	Elginburg.
Frontenac, C.	President	John Hamilton	Parham.
	Vice-President	G. D. Godfrey	Godfrey.
	Secretary	Geo. A. Smith	Parham.
	Treasurer	Wm. Bradshaw	Tichborne.
Glengarry.	President	W. E. McKillican	Vankleek Hill.
	Vice-President	A. A. McLennan	Lancaster.
	Sec.-Treas.	J. P. McNaughton	Dominionville.
Grenville, S.	President	Richard Connel	Roebuck.
	Vice-President	Lanson Lekerbie	Ventnor.
	Sec.-Treas.	G. W. Carson	Charleville.
Grey, C.	President	Geo. Badger	Red Wing.
	Vice-President	R. Fowler	Ventry.
	Sec.-Treas.	J. I. Graham	Vandeleur.
Grey, N.	President	T. J. Harkness	Annan.
	Vice-President	M. Rutherford	Leith.
	Sec.-Treas.	A. S. Donald	Kilsyth.
Grey, S.	President	Robt. Morice	Durham.
	Vice-President	Daniel Hodge	Edge Hill.
	Sec. Treas.	Geo. Binnie	Bunessan.
Haldimand	President	Geo. Fleming	Hagersville.
	Vice-President	And. Mehlenbacher	Kohler.
	Secretary	R. E. King	De Cewsville.
	Treasurer	M. Toohey	Cayuga.
Halton	President	Matthew Dice	Milton.
	Vice-President	Jas. Reid	Campbellville.
	Sec.-Treas.	Ed. Nixon	Ashgrove.
Hastings, E.	President	S. J. Clarke	Corbyville.
	Vice-President	J. L. Newton	Chapman.
	Sec.-Treas.	H. C. Emerson	Corbyville.
Hastings, N.	President	Alex Glover	Queensboro.
	Vice-President	Richard Keene	Hazzard's Corners.
	Sec. Treas.	Fred. Comerford	Eldorado.
Hastings, W.	President	Geo. Nicholson	Wallbridge.
	Vice-President	F. B. Mallory	Frankford.
	Sec.-Treas.	Jno. A. Holgate	Foxboro.
Huron, E.	President	Thos. McMillan	Seaforth.
	Vice-President	Jas. Elliott	Bluevale.
	Sec.-Treas.	P. A. McArthur	Brussels.
Huron, S.	President	W. D. Sanders	Exeter.
	Vice-President	B. S. Phillips	Hensall.
	Sec.-Treas.	Robt. Gardiner	Farquhar.
Huron, W.	President	R. M. Young	Carlow.
	Vice-President	H. J. Morris	Loyal.
	Sec.-Treas.	Wm. Bailie	Dungannon.
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	Vice-President	J. H. Snarey	Croton.
	Sec.-Treas.	J. B. Brien	Ridgetown.
Kent, W.	President	David Fletcher	Fletcher.
	Vice-President	Frank Suitor	Chatham.
	Sec.-Treas.	J. R. Longmore	Chatham.
Lambton, E.	President	Jno. Hunter	Wyoming.
	Vice-President	Milton Moorehouse	Shetland.
	Sec.-Treas.	W. J. McAlpine	Warwick.
Lambton, W.	President	Wm. Jackson	Osborne.
	Vice-President	Frank C. Pretty	Wilkesport.
	Sec.-Treas.	Frank Young	Ladysmith.



## OFFICERS FOR 1906-7.—Continued.

Institute.		Name.	P.O. Address.
Lanark, N. (Officers for 1905).	President	Hugh Wilson.	Elphin.
	Vice-President	Wm. Dunlop	McDonald's Corner
	Sec.-Treas.	Jas. Balfour	Elphin.
Lanark, S.	President	W. J. Leaver	Perth.
	Vice-President	Wm. McNaughton	Balderson.
	Sec.-Treas.	Geo. Oliver.	Perth.
Leeds, N., and Grenville	President	Andrew Carson	Burritt's Rapids.
	Vice-President	J. B. Arnold.	Easton's Corners.
	Sec.-Treas.	F. A. J. Davis	Merrickville.
Leeds, S.	President	W. M. Bass.	Newboro.
	Vice-President	C. F. Rath	Lansdowne.
	Sec. Treas.	Freeman Britton	Gananoque.
Lennox	President	T. B. Lund	Napanee.
	Vice-President	Robt. Metzler.	Odessa.
	Secretary	D. Aylesworth.	Bath.
	Treasurer	W. N. Dollar	Napanee.
Lincoln	President	S. H. Rittenhouse.	Jordan Harbor
	Vice-President	D. H. Moyer	Campden.
	Sec.-Treas.	J. Pawling.	Pt. Dalhousie.
Manitoulin, E. (Officers for 1905).	President	Wm. Hare.	Sandfield.
	Vice-President	Geo. Hughson	Manitowaning.
	Sec.-Treas.	A. J. Wagg.	Mindemoya.
Manitoulin, W.	President	Fred Smith	Gore Bay.
	Sec.-Treas.	And. Hall.	Gore Bay.
Middlesex, E.	President	A. A. Dodds	Derwent.
	Vice-President	S. Bourne	Rebecca.
	Sec.-Treas.	J. H. Wheaton	Thorndale.
Middlesex, N.	President	Richard Tweddle	Nairn.
	Vice-President	Dugald Graham	Ivan.
	Sec.-Treasurer	Wm. T. Amos	Lieury.
Middlesex, W.	President	L. G. Lethbridge.	Strathburn.
	1st Vice-President.	Jno. Mitchell	Glencoe.
	2nd Vice-President.	Hugh McCallum	Walkers.
	Sec.-Treas.	Chas. M. Macfie.	Appin
Monck	President	Allan Robins	Wellandport.
	Vice-President	Gavin Henderson	Perry Station
	Sec.-Treas.	J. E. Cohoe.	Wellandport.
Muskoka, C.	President	Alfred Kay.	Port Sydney.
	Vice-President.	Edward Hamilton.	Raymond
	Sec.-Treas.	John Wilson	Utterson.
Muskoka, N.	President.	T. Bradley.	Huntsville, Box 46.
	Vice-President.	W. D. Forest.	Huntsville, Box 151.
	Sec.-Treas	Wm. Clark	Huntsville, Box 3.
Muskoka, S.	President.	W. C. Denniss	Bracebridge.
	Vice-President	Jno. J. Beaumont.	Bracebridge.
	Sec.-Treas.	Alex. Barron	Bracebridge.
Port Carling.	President.	Jos. McCully.	Port Carling.
	Vice-President	Robt. Trouten	Brackenrig.
	Sec.-Treas.	Geo. Terry.	Hutton House.
Nipissing, W.	President.	A. D. Besserer	North Bay.
	Vice-President	Wm. Guthrie.	Warren.
	Secy-Treas.	Jno. A. Carmichael	North Bay.
Norfolk, N.	President.	W. A. Byerley.	Courtland.
	1st Vice-President.	S. C. Kitchen.	Bloomsburg.
	2nd Vice-President.	L. O. McConnell.	Delhi.
	Sec.-Treas.	F. L. Culver.	Waterford.
Norfolk, S.	President.	Jas. Symington	Port Dover.
	Vice-President.	Abram Neilson.	Walsh.
	Secy-Treas.	N. S. Palmerston	Walsh.
Northumberland, E.	President.	R. O. Morrow.	Hilton.
	Vice-President	J. N. Stone.	Norham.
	Sec.-Treas.	H. H. Bate.	Brighton.

OFFICERS FOR 1906-7.—*Continued.*

Institute.		Name.	P.O. Address.
Northumberland, W.	President.	Thos Hoskin.	The Gully.
	Vice-President	Jno. Mason	Cobourg.
	Sec.-Treas.	R. Cullis	Camborne.
Ontario, N.	President	Wm. Shier	Sunderland.
	1st Vice-President.	Asa Millard	Altona.
	2nd Vice-President.	I. C. Sproule	Cannington.
	Sec.-Treas.	Jos. E. Gould	Uxbridge.
Ontario, S.	President.	J. L. Smith.	Whitby.
	Vice-President	Jas. McFarlane	Claremont.
	Sec.-Treas.	Elmer Lick	Oshawa.
Oxford, N.	President.	David Lawrence.	Thamesford.
	1st Vice-President	Herman Bollert	Cassel.
	2nd Vice-President.	Arthur King	Plattsville.
	Sec.-Treas.	A. L. Currah.	Bright.
Oxford, S.	President.	J. H. Forden	Beachville.
	Vice-President.	J. W. Cohoe.	New Durham.
	Sec.-Treas.	W. R. Carroll	Norwich.
Parry Sound, E.	President.	Jno. Duke.	Burk's Falls.
	Vice-President.	Jno. Paget.	Sundridge.
	Sec.-Treas.	Thos. Bottomley	South River.
Parry Sound, W. (Officers for 1905)	President.	C. Sarney.	Parry Sound.
	Vice-President	W. H. Bundy	Parry Sound.
	Sec.-Treas.	R. Reece Hall	Parry Sound.
Peel.	President.	P. G. Dunton	Britannia.
	1st Vice-President	E. C. Monkman	Castleberg.
	2nd Vice-President.	J. C. McArthur.	Brookside.
	Sec.-Treas.	T. J. Cumberland	Brampton.
Perth, N.	President.	Geo. Goetz	Sebringville.
	Vice-President.	Jno. Munro.	Milverton.
	Sec.-Treas.	S. H. Pugh	Milverton.
Perth, S.	President.	J. W. Pearn	St. Mary's.
	Vice-President.	D. McBeth	St. Pauls.
	Sec.-Treas.		
Peterboro, E.	President.	F. Birdsall.	Birdsall.
	Vice-President	E. Hawthorne	Warsaw.
	Sec.-Treas.	Chas. O'Reilly.	Norwood.
Peterboro, W.	President.	J. N. Telford	Bridgenorth.
	Vice President	Fred McKee.	Selwyn.
	Sec.-Treas.	Wm. Collins.	Peterboro, Box 926.
Prescott	President.	Jonathan Cross	Caledonia Springs.
	Vice-President.	John Johnston	Little Rideau.
	Sec.-Treas.	W. Macadam	Vankleek Hill.
Prince Edward	President.	A. M. Clark	South Bay.
	Vice-President.	P. N. Gilbert	Gilbert's Mills.
	Sec.-Treas.	W. A. Christy	Bloomfield.
Rainy River, S.	President.	Geo. Strachan, Sr	Box Alder.
	Vice-President	Jno. Ritchie	Barwick.
	Sec.-Treas.	T. A. Boucher	Emo.
Renfrew, N.	President.	O. Wright	Beachburg.
	Vice-President.	John Collins	Beachburg.
	Sec.-Treas.	John Brown	Beachburg.
Renfrew S.	President.	D. Muirhead.	Renfrew.
	Vice-President.	D. Barr, Sr	Renfrew.
	Sec.-Treas.	G. MacIntyre.	Renfrew.
Russell	President.	Hon. W. C. Edwards.	Rockland.
	1st Vice-President	D. McDonald	Pana.
	2nd Vice-President.	N. F. Wilson, M.P.	Cumberland.
	Sec.-Treas.	W. R. Craig	Russell.
Simcoe, C.	President.	R. Graham	Saurin.
	Vice-President.	Jno. Anderson.	Crossland.
	Sec.-Treas.	Wm. Pratt.	Penetang.
Simcoe E.	President.	E. W. Kitchen.	Lovering.
	Vice-President.	J. S. Nelson	Price's Corners.
	Sec.-Treas.	R. A. Lehmann	Orillia.



OFFICERS FOR 1906-7.—*Concluded.*

Institute.		Name.	P.O. Address.
Simcoe, S. ....	President.....	Jno. Semple .....	Tottenham.
	Vice-President.....	J. A. Kidd .....	Cookstown.
	Sec.-Treas .....	W. J. Lennox .....	Newton Robinson.
Simcoe, W. ....	President.....	J. A. McDermid .....	Stayner, Box 164.
	1st Vice-President.....	Jno. Smith .....	Duntroon.
	2nd Vice-President.....	David Smith .....	Smithdale.
	Sec.-Treas .....	Jno. McKee .....	Duntroon.
St. Joseph, Is. ....	President.....	Geo. Fish .....	Carterton.
	Vice-President .....	J. G. Reesor .....	Carterton.
	Sec.-Treas .....	Albert Young .....	Richard's Landing.
Temiscamingue Dist. ....	Secretary .....	R. Parker .....	Uno Park.
Victoria, E. ....	President.....	W. H. Cullis .....	Powle's Corners.
	Vice-President.....	Isaac Fee .....	Mt. Pleasant.
	Sec.-Treas .....	Wm. Thurston .....	Bobcaygeon.
Victoria, W. ....	President.....	Wm. Channon .....	Oakwood.
	Vice President.....	Donald Jackson .....	Woodville.
	Sec.-Treas .....	Jas. Keith .....	Lindsay.
Waterloo, N. ....	President.....	A. B. Snyder .....	Elmira.
	1st Vice-President.....	A. Doering .....	Crosshill.
	2nd Vice-President.....	Josiah Stauffer .....	Waterloo.
	Sec.-Treas .....	Allen Shantz .....	Waterloo.
Waterloo, S. ....	President.....	J. D. Newstead .....	Preston.
	1st Vice-President.....	W. C. Shaw .....	Hespeler.
	2nd Vice-President.....	S. S. Herner .....	Mannheim.
	3rd Vice-President .....	Walter Oliver .....	Branchton.
	Ass't Sec. ....	C. D. Brown .....	Haysville.
	Secretary .....	Wm. Slater .....	Galt.
Welland.....	President.....	Chas. E. Sauer .....	Chippewa.
	Vice-President.....	Wallace Felts .....	Welland Station.
	Sec.-Treas .....	W. H. Gainer .....	Welland.
Wellington, C. ....	President.....	R. J. Kerr .....	Mimosa.
	Vice-President.....	And. Thomson .....	Fergus.
	Sec.-Treas .....	R. D. Nodwell .....	Hillsburg.
Wellington, E. ....	President.....	Alfred Hutchison .....	Mount Forest
	Vice-President.....	D. McKenzie .....	Cedarville.
	Sec.-Treas .....	Chester Nicholson .....	Mount Forest.
Wellington, S. ....	President.....	Jno. Barber .....	Guelph.
	1st Vice-President.....	Wm. Scott .....	Eramosa.
	2nd Vice-President.....	J. A. Cockburn .....	Aberfoyle.
	Sec.-Treas .....	G. B. Hood .....	Guelph.
Wellington, W. ....	President.....	E. S. Wooddissee .....	Rothsay.
	Vice-President .....	F. J. Short .....	Moorefield.
	Sec.-Treas .....	S. M. Clemons .....	Drayton.
Union.....	President.....	Alex. Drummond .....	Clifford
	Vice-President.....	Jno. Pritchard .....	Redgrave.
	Sec.-Treas .....	David Campbell .....	Clifford.
Wentworth, N. ....	President.....	T. B. Watson .....	Kirkwall.
	1st Vice-President.....	G. N. Harris .....	Lynden.
	2nd Vice-President.....	J. A. Gray .....	Freelton.
	Sec.-Treas .....	Alfred Purnell .....	Puslinch.
Wentworth, S. ....	President.....	Jno. Clough .....	Binbrook.
	Vice-President.....	J. H. McNeilly .....	Stoney Creek.
	Sec.-Treas .....	Erland Lee .....	Stoney Creek.
York, E. ....	President.....	Jno. Kennedy .....	Agincourt.
	1st Vice-President.....	Geo. Robinson .....	Markham.
	2nd Vice-President.....	Geo. Robins .....	Malvern.
	3rd Vice-President .....	J. E. Elliott .....	Lansing.
	Sec.-Treas .....	A. J. Reynolds .....	Scarboro Jct.
York, N. ....	President.....	Luke Gibbons .....	Glenville.
	Vice-President .....	Archie McCallum .....	Laskay.
	Sec.-Treas .....	F. W. Heacock .....	Aurora.
York, W. ....	President.....	T. A. Farr .....	Thistletown.
	Vice-President .....	A. T. Orth .....	Kleinburg.
	Sec.-Treas .....	R. L. Crawford .....	Emery.

REPORT  
OF THE  
WOMEN'S INSTITUTES  
OF THE  
Province of Ontario  
1906

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(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO.



TORONTO: 1906.  
Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty.



WARWICK BROS & RUTTER, Limited, Printers  
TORONTO

To the Honourable WILLIAM MORTIMER CLARK, K.C.,

*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOUR :

I have the pleasure to present herewith for the consideration of your Honour the Report of the Women's Institutes of Ontario for 1906.

Respectfully submitted,

NELSON MONTEITH,

*Minister of Agriculture.*

TORONTO, 1906.



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# WOMEN'S INSTITUTES OF ONTARIO.

1906.

## ANNOUNCEMENT OF THE SUPERINTENDENT.

The time has now arrived to report the year's work ending June, 1906, and we are pleased to be able to record a marked growth. The number of organizations is considerably in excess of the previous year, and the total membership at the end of May was 10,479. A change was made in the membership year, by which both the membership and financial year end May 31. It is difficult, therefore, to make an exact comparative statement with previous years. The figures indicate, however, that there has been a marked growth in the number of organizations, meetings held, and membership.

Women's Institute work was undertaken for the first time this year in the Rainy River, Lake of the Woods and Temiscamingue Districts, with the result that some twenty organizations were formed; and from the enthusiasm shown by the newly appointed officers and members there is every indication of effective work being accomplished. There is no section of the Province where Women's Institute work should be more highly appreciated than in those sections where the women on the farms do not enjoy the privileges of the older sections of the Province, so far as social advantages, lectures, literature, etc., are concerned.

We wish most sincerely to express our gratefulness to the many officers throughout the Province who have put so much time and labor in the work, more especially as new rules and regulations have not yet been printed for the guidance of the officers, that they may the better deal with the new conditions which are arising from the establishment of so many branches. Much difficulty has been experienced in formulating rules. Officers will be pleased to note that permission has been obtained to publish from time to time, say every two months, a bulletin dealing quite exhaustively with one or more subjects, the same to be used by officers and members as a basis for their programmes of work from month to month, if they so desire. The periodical which was recognized as the official organ of Institutes last year, ceased publication early in 1906, and thus left the Institute officers considerably handicapped in their attempts to carry on the monthly meetings regularly. The issuing of periodical bulletins for the members will no doubt be found of great assistance in guiding the work of the Institute.

## GRANTS.

The liberality of the Department in giving a small grant to each branch Institute has had the effect of stimulating the work. This has been an encouragement and inspiration to the officers and has enabled them to do much more effective work. Grants are being paid this year only to those Institutes which have held four meetings during the year ending May 31, which have a membership of 15, and have furnished satisfactory financial statements to the Department.

We wish to draw the attention of our readers to the report of the annual convention which appears herein. Much of interest to all members will be found therein, while officers generally will be much benefited by the advice of officers who have been successful in their local institute work.

GEO. A. PUTNAM,

*Superintendent.*



## REPORTS OF LOCAL WOMEN'S INSTITUTES

No.	Institute District.	Receipts.					
		Membership for 17 months, ending May 31st, 1906.	No. of Meetings held.	Total attendance.	No. of papers read or ad- dresses delivered.	Cash on hand per last Report.	Members' Fees.
						\$ c.	\$ c.
1	Amherst Island .....	53	13	553	16	24 76	9 25
2	Brant, North .....	174	42	1297	93	48 62	10 50
3	Brant, South .....	222	30	878	54	41 17	23 91
4	Bruce, Centre .....	110	30	538	36	33 08	17 25
5	Bruce, North .....	65	2	32	7	.....	.....
6	Bruce, South .....	41	10	237	17	38 12	8 50
7	Bruce, West .....	156	25	515	35	39 99	18 25
8	Dufferin .....	233	63	2010	138	31 42	39 25
9	Dundas .....	56	12	160	10	6 69	9 75
10	Durham, East .....	163	13	175	17	31 62	38 50
11	Durham, West .....	83	40	1070	93	34 74	20 50
12	Elgin, East .....	156	24	1055	42	58 07	21 95
13	Elgin, West .....	44	6	237	10	1 12	5 50
14	Essex, North .....	141	16	401	22	8 75	20 30
15	Grey, Centre .....	298	93	3024	105	73 05	50 00
16	Grey, North .....	164	59	1409	51	27 71	39 75
17	Grey, South .....	68	30	675	62	17 58	14 00
18	Haldimand .....	393	89	2526	151	49 10	44 10
19	Halton .....	603	93	3626	184	116 92	59 75
20	Hastings, East .....	308	38	801	64	78 69	45 75
21	Hastings, North .....	269	29	572	46	44 68	19 55
22	Hastings, West .....	96	13	520	37	24 10	11 75
23	Huron, East .....	148	49	518	38	6 58	30 00
24	Huron, South .....	73	11	347	14	26 65	5 90
25	Kent, West .....	24	7	194	11	1 95	1 50
26	Huron, East .....	225	52	1965	84	21 66	28 75
27	Kent, West .....	112	26	955	69	37 70	9 00
28	Lambton, East .....	32	9	224	10	5 20	2 50
29	Lambton, West .....	31	9	114	14	14	5 00
30	Lennox .....	52	8	84	8	1 92	12 50
31	Lincoln .....	188	19	666	35	8 63	46 00
32	Middlesex, North .....	396	62	2435	115	70 16	72 28
33	Middlesex, West .....	59	13	265	23	25 99	5 50
34	Monck .....	81	18	362	12	8 02	12 75
35	Muskoka, South .....	79	23	358	38	16 21	17 00
36	Norfolk, North .....	58	8	119	16	23 26	1 50
37	Northumberland, East .....	210	36	1709	69	62 00	27 00
38	Northumberland, West .....	236	40	701	60	18 20	23 25
39	Ontario, North .....	52	8	90	7	21 35	6 50
40	Ontario, South .....	90	32	821	57	16 54	18 50
41	Oxford, North .....	96	27	634	44	4 95	17 00
42	Oxford, South .....	287	65	2066	73	65 65	32 50
43	Peel .....	541	67	2429	161	28 85	86 75
44	Perth, North .....	75	5	265	14	18 92	6 25
45	Perth, South .....	35	11	437	16	22 83	5 00
46	Peterboro, East .....	52	13	335	12	35 22	4 00
47	Peterboro, West .....	75	9	223	12	5 73	17 75

FOR THE YEAR ENDING MAY 31st, 1906.

Receipts— <i>Con.</i>					Expenditures.												
Receipts from Conventions and Excursions.																	
Miscellaneous.																	
Total Receipts.																	
Expenses for Meetings.																	
Secretary's Salary, etc.																	
Postage and Stationery.																	
Printing and Advertising.																	
Lecturers' Expenses.																	
Periodicals for Members.																	
Miscellaneous.																	
Total Expenditures.																	
Balance on hand.																	
Total.																	
No.																	
\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
		2 00	56 01	19 00	9 00	2 30	1 00	6 50	13 50			51 30	4 71	56 01		1	
		1 75	85 87	26 25	10 00	6 26	5 00	12 80	4 45	10 21	74 97	10 90	85 87			2	
		15 80	131 88	19 67	15 00	16 20	2 50	11 95		10 20	75 52	56 36	131 88			3	
		77	107 10	10 12	7 00	3 86		50	24 50	12 70	2 77	61 45	45 65	107 10		4	
																5	
		41	92 03	3 55	10 00		92	4 00	7 85		4 95	31 27	60 76	92 03		6	
		11 00	114 24	49 69	10 00	5 01	2 75	7 00	11 35	14 25	100 05	14 19	114 24		7		
62 85		8 95	211 47	21 54	44 00	7 61	15 65	28 90	18 25	17 34	153 29	58 18	211 47		8		
			32 44	11 45		5 54					16 99	15 45	32 44		9		
		8 55	142 67	1 58	2 40	3 38				10	83 54	91 00	51 67	142 67		10	
		55	115 79	15 00	10 00	7 11	10 25	6 55	15 10	1 30	65 31	50 48	115 79		11		
		1 30	141 32	13 85	25 00	5 05	13 80	21 80		44 80	124 30	17 02	141 32		12		
		3 44	70 06	11 50	10 00	4 31	3 00	8 25		13 02	50 08	19 98	70 06		13		
		5 29	63 34	7 00	10 00	2 40	9 60	4 30		3 10	36 40	26 94	63 34		14		
		41 60	233 65	22 00	10 75	11 19	9 25	45	22 75	47 29	123 68	109 97	233 65		15		
		11 17	143 63	7 41	15 00	7 93	5 91	14 83	3 43	38 63	93 14	50 49	143 63		16		
		4 24	81 82	19 05	10 00	2 89	8 00	23 55	1 00	5 05	69 54	12 28	81 82		17		
		20 90	195 10	7 20	12 10	7 59	7 00	3 50	6 17	20 92	64 48	130 62	195 10		18		
		51 48	314 15	19 85	60 50	13 27	15 45	17 27	21 40	75 56	323 30	90 85	314 15		19		
		43 20	242 64	6 45	62 25	4 24	8 30	11 95	7 76	98 16	199 11	43 53	242 64		20		
		14 86	120 09	10 82	10 00	3 31	2 50	20	8 17	13 86	48 86	71 23	120 09		21		
		85	56 70	1 00	10 00	7 23	4 50			10 00	32 73	23 97	56 70		22		
22 95		17	102 70	31 90	23 75	2 91	5 94	7 00	2 30	21 28	95 08	7 62	102 70		23		
		23 24	114 29	12 90	10 00	4 62	9 50	11 15	5 53	37 40	91 10	23 19	114 29		24		
			33 45	6 50		1 75	1 50	4 65		1 95	16 35	17 10	33 45		25		
		78 45	169 86	16 60		2 60	2 50	16 00	10 65	87 18	135 53	34 33	169 86		26		
		14 85	114 55	33 81	10 00	9 78	4 00	9 05	2 67	6 65	75 96	38 59	114 55		27		
		05	27 75	12 01	5 00	30		7 25			24 56	3 19	27 75		28		
			35 14			3 45	1 25	7 00		5 15	16 85	18 29	35 14		29		
			33 42		10 50		76	1 00		10 07	3 10	25 43	7 99	33 42		30	
		13 05	112 68	4 00	30 00	6 36	1 50	23 69		30 89	96 44	16 24	112 68		31		
16 58		5 75	226 77	19 85	25 00	8 20	8 54	1 92	1 91	53 51	118 93	107 84	226 77		32		
		1 86	67 35	11 05		1 46	2 75	13 65	20 87	12	49 90	17 45	67 35		33		
			58 27	3 00	10 00	5 26		15 23	1 00	16 09	50 58	7 69	58 27		34		
		27 68	97 89	1 00	8 00	3 96			4 15	10 00	27 11	70 78	97 89		35		
			54 76	3 00	10 00	2 08	1 50	1 60		2 34	20 52	34 24	54 76		36		
		24 58	171 58	4 50	20 00	9 26	9 90	7 75	40 30	27 80	119 51	51 57	171 58		37		
		31 85	128 30	10 25	25 50	4 95	4 50	28 93	2 00	9 53	85 66	42 64	128 30		38		
			57 85	13 10	10 00	6 50	6 60				36 20	21 65	57 85		39		
		10 36	98 40	5 00	10 00	6 74	9 00	8 55		65	4 90	44 84	53 56	98 40		40	
			90 95	18 75	21 10	2 62	9 10	11 57			80	63 94	27 01	90 95		41	
		4 39	206 89	73 47	20 00	15 33	5 30	7 77	2 65	25	124 77	82 12	206 89		42		
		16 75	181 35	15 85	51 15	13 84	18 50	4 70		50	11 79	116 33	65 02	181 35		43	
		8 44	62 61	5 75	11 00	95		5 30	1 00	2 00	26 00	36 61	62 61		44		
		5 33	58 16	8 00		1 50		4 00	3 50	13 45	30 45	27 71	58 16		45		
		19 55	78 77	3 50						10 00	55 00	68 50	10 27	78 77		46	
			43 48	15 00	10 00	2 13	3 60	2 00	2 50		35 23	8 25	43 48		47		



## REPORTS OF LOCAL WOMEN'S INSTITUTES

No.	Institute District.	Receipts.						
		Membership for 17 months, ending May 31st, 1906.	No. of Meetings held.	Total attendance.	No. of papers read or ad- dresses delivered.	Cash on hand per last report.	Members' Fees.	Grants.
						\$ c.	\$ c.	\$ c.
48	Renfrew, North .....	78	28	366	36	7 20	10 25	48 00
49	Simcoe, Centre .....	140	48	1148	95	16 30	32 50	69 00
50	Simcoe, South .....	66	9	439	20	20 27	22 25	31 00
51	Simcoe, West .....	229	35	980	50	31 25	35 25	93 00
52	Union .....	89	6	214	10	4 79	4 75	31 50
53	Victoria, East .....	109	19	539	36	12 78	11 25	35 00
54	Victoria, West .....	62	21	349	30	17 28	16 75	43 00
55	Waterloo, North .....	142	26	1540	62	37 54	31 25	35 00
56	Waterloo, South .....	349	12	820	26	.....	25 50	30 00
57	Welland .....	222	26	707	50	32 06	39 50	56 00
58	Wellington, Centre .....	139	83	3597	122	34 67	36 25	71 00
59	Wellington, East .....	189	28	1487	72	15 33	30 75	41 00
60	Wellington, South .....	117	48	1035	92	55 15	24 25	62 00
61	Wellington, West .....	190	39	2243	75	79 01	10 25	62 00
62	Wentworth, North .....	77	33	948	15	32 65	22 25	35 00
63	Wentworth, South .....	273	89	1846	93	44 71	70 25	117 00
64	York, East .....	173	36	346	53	25 37	26 50	86 50
65	York, West .....	165	25	789	43	5 60	41 75	54 00
<i>Northern Institutes.</i>								
1	Algoma, Centre .....	123	35	513	58	.....	26 75	15 00
2	Algoma, East .....	15	6	159	11	.....	.....	.....
3	Manitoulin, East .....	59	11	195	17	.....	11 00	.....
4	Manitoulin, West .....	130	4	50	9	.....	.....	.....
5	Nipissing, West .....	10	3	114	5	.....	.....	.....
6	St Joseph's Island .....	76	7	61	5	.....	20 00	5 00
7	Parry Sound, East .....	54	21	313	36	.....	.....	.....
8	Rainy River .....	.....	12	302	17	.....	.....	.....
9	Thunder Bay .....	.....	7	165	12	.....	.....	.....
Totals .....		10479	2114	51892	3452	\$1857	\$1572	\$3155

\* The membership year has been changed from "January to December" to "June to May." The total membership reported is, therefore, for seventeen months, but no names are counted twice.

FOR THE YEAR ENDING MAY 31ST, 1906.—Continued.

Receipts—Contin.			Expenditures.											No.														
Receipts from Conventions and Excursions.			Miscellaneous.		Total Receipts.		Expenses for Meetings.		Secretary's Salary, etc.		Postage and Stationery.		Printing and Advertising.		Lecturers' Expenses.		Periodicals for Members.		Miscellaneous.		Total Expenditures.		Balance on hand.		Total.			
\$	c.		\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.		
.....			6	50	71	95	1	50	5	00	2	29		70	6	00	19	75	9	45	44	69	27	26	71	95	48	
.....			24	15	141	95	24	25	15	00	7	27	4	25		50	5	38	29	56	86	21	55	74	141	95	49	
.....			8	40	81	92	10	20	20	00	3	53	1	58	4	50	6	50	12	45	58	76	23	16	81	92	50	
.....			79	79	239	29	60	31	15	00	4	24	4	75	.....	59	85	39	73	183	88	55	41	239	29	51		
.....			25	27	66	31	12	45	6	00	3	59	3	25	70	28	00	4	00	57	99	8	32	66	31	52		
20	40		10	79	53	3	50	23	50	2	01	30	35	.....	.....	9	85	.....	.....	69	21	10	32	79	53	53		
8	00		4	25	89	28	7	99	26	10	3	62	25	1	50	.....	.....	10	75	50	21	39	07	89	28	54		
.....			.....	.....	103	79	5	54	12	50	5	46	94	12	55	1	85	9	50	48	34	55	45	103	79	55		
31	59		.....	.....	87	09	14	78	31	50	5	36	17	75	10	55	.....	.....	3	09	83	03	4	06	87	09	58	
.....			1	20	129	36	4	57	7	50	4	05	2	13	5	25	13	15	4	20	40	85	88	51	129	36	57	
.....			39	142	31	26	24	37	05	8	38	9	25	4	20	2	00	5	70	92	82	49	49	142	31	58		
.....			.....	.....	87	08	22	97	10	00	7	44	5	50	3	75	11	30	1	24	62	20	24	88	87	08	59	
2	15		4	35	147	90	33	50	.....	5	32	1	00	4	65	27	25	18	20	89	92	57	98	147	90	60		
30	50		2	74	184	50	41	67	20	00	8	34	9	00	11	46	.....	.....	18	88	109	35	75	15	184	50	61	
.....			4	21	94	11	13	25	15	00	3	19	4	50	.....	15	50	6	97	58	41	35	70	94	11	62		
.....			45	89	277	85	41	09	11	00	42	60	27	50	13	90	5	80	28	38	170	27	107	58	277	85	63	
.....			.....	.....	138	37	20	73	27	65	10	12	7	00	21	05	13	00	9	84	109	39	28	98	138	37	64	
30	00		.....	.....	131	35	17	00	15	00	6	01	10	25	28	05	3	00	10	45	89	76	41	59	131	35	65	
20	50		54	90	117	15	50	.....	.....	5	03	6	50	.....	.....	29	62	19	35	61	00	56	15	117	15	1		
.....			.....	.....	11	00	.....	.....	.....	.....	1	54	.....	.....	.....	.....	2	00	.....	50	4	04	6	96	11	00	2	
.....			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	
.....			.....	.....	25	00	25	.....	.....	.....	2	13	.....	.....	.....	.....	.....	.....	.....	1	25	3	63	21	37	25	00	4
.....			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	
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.....			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	
\$245			\$797		\$7626		\$995		\$972		\$386		\$382		\$539		\$522		\$1160		\$4957		\$2269		\$7626			



# OFFICERS FOR 1906-7.

*Superintendent, GEO. A. PUTNAM, Parliament Buildings, Toronto.*

## DISTRICT INSTITUTES.

Institute.		Name.	P.O. Address.
Amherst Island	President	Mrs. R. D. McDonald	Emerald.
	Vice-President	Mrs. Henry Filson	Stella.
	Sec.-Treas.	Mrs. S. K. Tugwell	Stella.
Brant, N.	Hon. President	Mrs. Dr. Kitchen	St. George.
	President	Mrs. Jas. Heveron	St. George.
	1st Vice-President	Mrs. A. Humphrey	St. George.
	2nd Vice-President	Mrs. F. Dond	Branchton.
	3rd Vice-President	Mrs. H. Freeman	St. George.
Brant, S.	Sec.-Treas.	Miss Edith Burt	St. George.
	Hon. President	Mrs. J. N. Lester	Burford.
	President	Mrs. J. E. Brethour	Burford.
	Vice-President	Mrs. A. D. Muir	Burford.
	Sec.-Treas.	Miss E. A. Lester	Burford.
Bruce, C.	Asst.-Sec.	Miss Mary Metcalf	Burford.
	President	Mrs. D. McIntyre	Paisley.
	Vice-President	Mrs. T. F. Jackson	Ripley.
	Sec.-Treas.	Mrs. J. C. Seymour	Paisley.
Bruce, N.	President	Miss D. Davidson	Lion's Head.
	Vice-President	Mrs. W. B. Moore	Lion's Head.
	Sec.-Treas.	Mrs. D. Thompson	Lion's Head.
Bruce, S.	President	Miss Bessie Rowand	Walkerton.
	Sec.-Treas.	Mrs. E. McConnell	Walkerton.
Bruce, W.	President	Mrs. D. McTavish	North Bruce.
	1st Vice-President	Mrs. Jno. Thompson	Port Elgin.
	2nd Vice-President	Miss J. Richardson	North Bruce.
	Sec.-Treas.	Mrs. Jas. S. Cameron	Port Elgin.
Dufferin.	President	Mrs. R. Fife	Shelburne.
	1st Vice-President	Mrs. W. C. Hall	Shelburne.
	2nd Vice-President	Mrs. (Dr.) Barr	Shelburne.
	Sec.-Treas.	Mrs. J. J. Hall	Shelburne.
Dundas.	President	Mrs. T. J. White	Chesterville.
	Vice-President	Miss McGee	Chesterville.
	Sec.-Treas.	Mrs. Chester Casselman	Chesterville.
Durham, E.	President	Mrs. D. Milligan	Millbrook.
	1st Vice-President	Mrs. W. Gillott	Millbrook.
	2nd Vice-President	Mrs. H. Hassard	Millbrook.
	Sec.-Treas.	Mrs. J. R. Eakins	Millbrook.
Durham, W.	President	Mrs. T. Power	Bowmanville.
	Vice-President	Mrs. G. C. Haines	Bowmanville.
	Sec.-Treas.	Miss E. E. Haycraft	Bowmanville.
Elgin, E.	Hon. President	Dr. Annie Backus	Aylmer.
	President	Mrs. M. E. Lyons	Aylmer.
	1st Vice-President	Mrs. L. A. Brown	Aylmer.
	2nd Vice-President	Mrs. F. Paupst	Aylmer.
	Sec.-Treas.	Mrs. I. R. Prichard	Springfield.
Elgin, W.	Asst. Sec.	Mrs. M. Turrill	Aylmer.
	President	Mrs. Dan Graham	Dutton.
	Vice-President	Mrs. Arch. McWilliam	Dutton.
	Sec.-Treas.	Miss Minnie C. Gow	Wallacetown.
Essex, N.	President	Mrs. A. W. Cohoe	South Woodslee.
	Sec.-Treas.	Miss Edna Allison	South Woodslee.
Grey, C.	President	Mrs. J. I. Graham	Vandeleur.
	Vice-President	Mrs. R. Best	Flesherton.
	Sec.-Treas.	Mrs. A. E. Myles	Kimberley.

Grey, N.	Hon. President	Mrs. Jas. Gardner	Kemble.
	President	Mrs. Jos. Davidson	Lake Charles.
	1st Vice-President	Mrs. Wm. Whitelaw	Meaford.
	2nd Vice-President	Mrs. A. M. Taylor	Annan.
Grey, S.	Sec.-Treas.	Mrs. B. J. Long	Meaford.
	President	Mrs. D. McCrie	Durham.
	Vice-President	Mrs. C. Grey	Varney.
	Sec.-Treas.	Mrs. Thos. McGirr	Durham.
Haldimand	President	Mrs. E. E. Phillips	Selkirk.
	Vice-President	Mrs. J. Richardson	Caledonia.
	Sec.-Treas.	Mrs. W. M. Thompson	Canfield.
Halton	President	Mrs. L. L. Bennett	Georgetown.
	Sec.-Treas.	Miss Hattie Cook	Georgetown.
Hastings, E.	President	Mrs. A. Loucks	Foxboro.
	Vice-President	Mrs. T. E. Wilson	Tweed.
	Sec.-Treas.	Mrs. Currie English	Melrose.
Hastings, N.	President	Mrs. Wm. Meiklejohn	Bellview.
	Vice-President	Mrs. T. H. Reid	Bellview.
	Sec.-Treas.	Mrs. Jas. McComb	Bellview.
Hastings, W.	President	Mrs. J. Phillips	Wallbridge.
	Vice-President	Mrs. D. Coone	Frankford.
	Sec.-Treas.	Miss M. Jordon	Frankford.
Huron, E.	President	Mrs. W. G. Strong	Gorrie.
	Vice-President	Mrs. Wm. Goggins	Fordwich.
	Sec.-Treas.	Mrs. Jas. Armstrong	Gorrie.
Huron, S.	President	Miss J. Halls	Exeter.
	Vice-President	Mrs. F. Knight	Exeter.
	Sec.-Treas.	Mrs. A. Hastings	Exeter.
Huron, W.	President	Mrs. Wm. Jenkins	Holmesville.
	1st Vice-President	Mrs. S. Clark	Goderich.
	2nd Vice-President	Mrs. W. Bone	Wingham.
	Sec.-Treas.	Mrs. F. W. Watts	Clinton.
Kent, E.	President	Mrs. J. F. Stone	Highgate.
	Vice-President	Mrs. Souls	Highgate.
	Sec.-Treas.	Miss Etta Gosnell	Highgate.
Kent, W.	President	Mrs. Ed. LaMarche	Wheatley.
	Vice-President	Miss Dora Richards	Quinn.
	Sec.-Treas.	Miss S. Kennedy	Wheatley.
Lambton, E.	President	Mrs. Jno. Hunter	Wyoming.
	Vice-President	Mrs. Jno. Forbes	Kertch.
	Sec.-Treas.	Miss Addie Steadman	Wyoming.
Lambton, W.	President	Mrs. Wm. Tucker	Brigden.
	Vice-President	Mrs. Wm. Jackson	Osborne.
	Sec.-Treas.	Mrs. Jno. Ettles	Brigden.
Lennox	President	Mrs. Wm. Magee	The Pines.
	Vice-President	Miss M. Gibbs	Adolphustown.
	Sec.-Treas.	Miss Lilien Carr	Dorland.
Lincoln	President	Mrs. Duncan	Jordan Harbor.
	1st Vice-President	Mrs. W. B. Rittenhouse	Beamsville.
	2nd Vice-President	Mrs. M. Culp	Jordan.
	Sec.-Treas.	Mrs. E. W. Fry	St. Catharines.
Middlesex, E.	President	Mrs. P. Stewart	Parkhill.
	Vice-President	Miss Mac Willson	Greenway.
	Sec.-Treas.	Miss B. A. Muma	Coldstream.
Middlesex, W.	President	Mrs. Jas. Bogue	Strathroy.
	Vice-President	Mrs. M. Diggins	Strathroy.
	Sec.-Treasurer	Mrs. M. W. CummiFord	Strathroy.
Monck	President	Mrs. R. McOuett	Marshville.
	Vice-President	Mrs. Chas. Palmer	Marshville.
	Sec.-Treas.	Mrs. Angus Campbell	Marshville.
Muskoka, C.	President	Mrs. W. Emmett	Parkersville.
	Sec.-reas.	Mrs. A. B. Olimer	Parkersville.
Muskoka, S.	President	Mrs. C. Faires	Muskoka Falls.
	Vice-President	Miss C. Evans	Muskoka Falls.
	Sec.-Treas.	Mrs. J. T. Galbraith	Reay.



Norfolk, N.	President	Mrs. Frank Jarvis.	Simcoe.
	Vice-President	Mrs. A. R. Decou	Simcoe.
	Sec.-Treas.	Mrs. Safford C. Kitchen.	Bloomsburg.
Northumberland, E.	President	Mrs. Esti Terrell	Wooler.
	1st Vice-President	Mrs. Royal McQuoid	Smithfield.
	2nd Vice-President	Mrs. W. H. Dempsey	Wooler.
	3rd Vice-President	Mrs. E. Love	Trenton.
	Sec.-Treas.	Miss Kate Murray	Trenton.
Northumberland, W.	President	Mrs. R. C. Allen	Cobourg.
	Vice-President	Mrs. W. J. Huston	Cobourg.
	Sec.-Treas.	Mrs. J. J. Hinman	Cobourg.
Ontario, N.	President	Mrs. W. Lapp	Uxbridge.
	Vice-President	Mrs. D. Ferguson	Uxbridge.
	Sec.-Treas.	Mrs. C. S. Goodrich	Uxbridge.
Ontario, S.	President	Mrs. Wm. Purves	Columbus.
	1st Vice-President	Mrs. J. B. Mitchell	Whitby.
	2nd Vice-President	Mrs. R. R. Mowbray	Kinsale.
	Sec.-Treas.	Miss Dell. Brown	Whitby.
Oxford, N.	President	Mrs. D. Dewar	Bright.
	Vice-President	Mrs. J. Craig	Bright.
	Sec.-Treas.	Miss B. Gilholm	Bright.
Oxford, S.	President	Mrs. W. E. Pollard	Burgessville.
	1st Vice-President	Mrs. W. A. Elliott	Brownsville.
	2nd Vice-President	Mrs. H. A. Strathick	Springford.
	Sec.-Treas.	Mrs. J. C. Smart	Springford.
Peel	President	Mrs. Jas. Davidson	Inglewood.
	Vice-President	Mrs. W. J. Hunter	Brampton.
	Sec.-Treas.	Miss Susie Campbell	Brampton.
Perth, N.	President	Mrs. W. Connell	Milverton.
	1st Vice-President	Mrs. H. Scheafer	Milverton.
	2nd Vice-President	Mrs. J. T. Grosch	Milverton.
	Sec.-Treas.	Mrs. A. D. Alexander	Milverton.
Perth, S.	President	Mrs. Ball	Tavistock.
	Sec.-Treas.	Miss Ethel Norris	Cromarty.
Peterboro, E.	President	Mrs. Dr. Douglas	Warsaw.
	Vice-President	Mrs. Geo. Taylor	Warsaw.
	Treasurer	Mrs. Steedham	Warsaw.
	Cor. Sec.	Mrs. Brown	Warsaw.
	Rec. Sec.	Miss Annie Hawthorne	Warsaw.
Peterboro, W.	President	Mrs. A. Higgins	Lakefield.
	Vice-President	Mrs. J. Lemay	Lakefield.
	Sec.-Treas.	Mrs. G. Fitzgerald	Lakefield.
Renfrew, N.	President	Mrs. Jno. Dougherty	Beachburg.
	Vice-President	Mrs. H. B. Christman	Beachburg.
	Sec.-Treas.	Mrs. Jno. A. Binnie	Beachburg.
Simcoe, C.	President	Mrs. N. McRae	Wyebridge.
	Vice-President	Mrs. H. G. Todd	Randolph.
	Sec.-Treas.	Mrs. W. N. Belyea	Wyebridge.
Simcoe, S.	President	Mrs. R. W. Sloan	Churchill.
	Vice-President	Mrs. Jas. Allen	Churchill.
	Sec.-Treas.	Mrs. W. S. Moore	Churchill.
Simcoe, W.	President	Mrs. Rose	Sunnidale Cors.
	Vice-President	Mrs. F. E. Webster	Creemore.
	Sec.-Treas.	Miss A. Ovens	Duntroon.
Union	President	Mrs. Mary Miller	Clifford.
	Vice-President	Mrs. J. Scott	Clifford.
	Sec.-Treas.	Miss N. Carter	Clifford.
Victoria, E.	President	Mrs. Wm. Fell	Bury's Green,
	Vice-President	Mrs. Dr. Gould	Fenelon Falls.
	Sec.-Treas.	Miss Emily Nie	Fenelon Falls.
Victoria, W.	President	Mrs. D. W. King	Oakwood.
	Vice-President	Mrs. E. Y. Yers	Little Britain.
	Sec.-Treas.	Mrs. Jas. Birchard	Linden Valley.
Waterloo, N.	President	Mrs. A. Brown	Winterbourne.
	Vice-President	Mrs. Lackner	Hawkesville.
	Sec.-Treas.	Miss Lucinda Bellinger	Wellesley.

Waterloo, S.	President.	Mrs. Thomas Shaw	Hespeler.
	Vice-President	Mrs. J. Jamieson	Hespeler.
	Sec.-Treas	Mrs. Will Elliott	Galt.
Welland.	President.	Mrs. E. H. Miller	Bridgeburg.
	Vice-President	Mrs. Joe Clark	Ridgeway.
	Sec.-Treas	Miss M. Willson	Welland.
Wellington, C.	President.	Mrs. R. C. Nodwell	Hillsburg.
	Vice-President	Mrs. M. McKinnon	Hillsburg.
	Sec.-Treas	Mrs. Jas. McLachlan	Erin.
Wellington, E.	President.	Mrs. J. P. Beer	Arthur.
	Vice-President	Mrs. Wm. Anderson	Damascus.
	Sec.-Treas	Miss Mary Wales	Arthur.
Wellington, S.	President.	Mrs. Wm. Harris	Rockwood.
	Vice-President	Miss Lang	Corwin.
	Sec.-Treas	Miss Alice Whitelaw	Guelph.
Wellington, W.	President.	Mrs. W. Brimblecombe	Drayton.
	Vice-President	Mrs. F. Short	Moorefield.
	Sec.-Treas	Mrs. L. M. Clemens	Drayton.
Wentworth, N.	President.	Mrs. Dr. Gibson	Lynden.
	Vice-President	Mrs. J. F. Thompson	West Flamboro.
	Sec.-Treas	Mrs. J. E. McDonough	Westover.
Wentworth, S.	President	Mrs. J. H. McNeilly	Stoney Creek.
	1st Vice-President	Mrs. Erland Lee	Stoney Creek.
	2nd Vice-President	Mrs. Beven	Ancaster.
	3rd Vice-President	Mrs. Henry French	Hannon.
	Sec.-Treas	Miss J. R. Carpenter	Fruitland.
York, E.	President.	Mrs. R. Forfar	Ellesmere.
	Vice-President	Mrs. D. Marshall	Ellesmere.
	Lec.-Treas	Miss Lula Reynolds	Scarboro Jct.
York, N.	President.	Mrs. Chas. Doane	Weston.
	Vice-President	Mrs. Ezra Lundy	Weston.
	Sec.-Treas	Miss Bessie Clelland	Newmarket.
York, W.	President	Mrs. Wm. Ellerby	Newmarket.
	1st Vice-President	Mrs. La. R. Lemaire	Newmarket.
	2nd Vice-President	Mrs. J. D. McLean	Woodbridge.
	Sec.-Treas	Miss Helen J. Grubbe	Thistle town.

## BRANCH INSTITUTES.

Name of Branch.	President.	Secretary.
<i>North Brant.</i>		
Moyle and Tranquility	Mrs. Nunnick, Brantford	Miss M. E. Good.
Onondaga	Mrs. M. Simpson	Mrs. J. W. Hedley.
Paris	Miss E. O'Neil	Mrs. M. Deans.
<i>South Brant.</i>		
Mohawk	Mrs. Hull	Mrs. T. H. Mott.
Cathcart	Mrs. R. Warboys	Miss C. Stephenson.
Ohsweken	Mrs. Robert Martin	Miss L. Jamieson.
<i>Centre Bruce.</i>		
Kincardine	Miss A. McCaskill	Miss M. McCosh.
Paisley	Mrs. D. McIntyre	Mrs. J. C. Seymour.
Ripley	Mrs. R. J. Graham	Miss J. Pritchard.
<i>South Bruce.</i>		
Holyrood		Miss M. Langford.
Walkerton	Miss Bessie Rowand	Miss E. McConnell.
<i>West Bruce.</i>		
Tara	Mrs. G. Hooper	Miss G. Brunton.
Allenford	Mrs. Thomas Dorman	Miss M. C. Hewitson.
<i>Dufferin.</i>		
Horning's Mills	Mrs. (Rev.) Eccelson	Miss M. Holmes.
Perm.	Mrs. James Banks	Miss E. Ferris.
Relessey	Mrs. Mills	Miss C. McGuire.
Laurel	Mrs. B. Curry	Mrs. E. Richardson.
Honeywood	Mrs. Jno. McLean	Mrs. Geo. Laking.
Camilla	Miss McNaughton	Mrs. O. Banks.
Orangeville	Mrs. H. Endicott	Mrs. D. McPherson.
Whittington	Mrs. L. Leader	Miss K. Clark.



Name of Branch.	President.	Secretary.
<i>Dundas.</i>		
Morewood.....	Mrs. C. Smirl.....	Mrs. W. E. McConnell.
<i>East Durham.</i>		
Garden Fill.....	Mrs. Wilson.....	Miss S. E. Gray.
Mt. Pleasant.....	Mrs. T. Jamieson.....	Mrs. A. Rutherford.
Baillieboro.....	Mrs. Bonns.....	Mrs. Jno. Greer.
Springville.....	Mrs. R. Horton.....	Mrs. A. Sanderson.
<i>West Durham.</i>		
Solina.....	Mrs. R. J. McKessock.....	Miss Nora Werry.
Hampton.....	Mrs. J. G. Burns.....	Mrs. C. J. Kerslake.
Nestleton.....	Mrs. Robt. Thompson.....	Miss Eva J. Malcolm.
Starkville.....	Miss R. A. Walsh, Orono.....	Miss M. E. Rutherford,
<i>East Elgin.</i>		
Pt. Burwell.....	Mrs. R. C. Drake.....	Miss Beatrice Markle.
Springfield.....	Mrs. F. C. Muller.....	Miss Jessie Turner.
<i>West Elgin.</i>		
Rodney.....	Mrs. E. J. Schmid.....	Mrs. B. B. Graham.
<i>North Essex.</i>		
Essex.....	Mrs. A. W. Metcalfe.....	Mrs. R. W. Anglin.
Oldcastle.....	Miss J. McCartney.....	Mrs. Geo. Welsh.
<i>Centre Grey.</i>		
Feversham.....	Miss L. Guy, Maxwell.....	Miss E. Alister.
Flesherton.....	Mrs. T. R. McKenzie, Port Law.....	Mrs. Wm. Wilcox.
Vandeleur.....	Mrs. S. Douglas.....	Mrs. Geo. Warling.
Heathcote.....	Mrs. R. Thomson.....	Miss S. Clark.
Ravenna.....	Mrs. W. Buchanan.....	Mrs. A. R. Latter.
Kimberley.....	Mrs. W. Ellis.....	Miss Clara Hurd.
Walter's Falls.....	Mrs. T. Barker.....	Mrs. R. H. Olmstead.
Williamsford.....	Mrs. W. McMitchell.....	Mrs. L. Becker.
Priceville.....	Miss Anna James.....	Miss J. McArthur.
Hopeville.....	Mrs. Geo. Gilkes.....	Mrs. James Scott.
Badgeros.....	Mrs. Chas. Priddle.....	Miss E. M. Small.
<i>North Grey.</i>		
Desboro.....	Mrs. Jno. Milburn.....	Miss Lizzie Hanbury.
Chatsworth.....	Mrs. S. H. Breese.....	Mrs. T. H. Collins.
Kilsyth.....	Mrs. Ed. Portens, Squire.....	Mrs. J. H. Moore.
Annan.....	Mrs. C. P. Day, Leith.....	Miss N. J. Cannon.
St. Vincent.....	Mrs. B. J. Long, Meaford.....	Mrs. W. A. Johnston,
		Meaford.
Kemble.....	Mrs. John Ward.....	Mrs. Jas. Gardner.
Brookholm.....	Mrs. Vanstone.....	Mrs. H. A. Nicol.
<i>South Grey.</i>		
Holstein.....	Mrs. J. Murdock.....	Mrs. W. Rogers.
Elmwood.....	Mrs. A. Wilson.....	Miss E. Tulloch.
Durham.....	Mrs. D. McCrie.....	Mrs. T. McGirr.
Hanover.....	Mrs. Dr. Rogers.....	Mrs. W. Bartleman.
<i>Haldimand.</i>		
Selkirk.....	Mrs. A. Lamb.....	Mrs. E. Kendrick.
York.....	Mrs. E. Moore.....	
Clanbrassil.....	Mrs. Turnbull.....	Mrs. Jas. McConachie.
DeCewsville.....	Mrs. R. E. King.....	Mrs. O. Warner.
Cheapside.....	Mrs. Dr. Sherk.....	Mrs. F. D. Awde.
Nanticoke.....	Mrs. W. Evans.....	Miss M. E. Kenny.
Canfield.....	Mrs. J. Badgley.....	Mrs. W. M. Thompson.
Springvale.....		Miss L. Winger.
Jarvis.....	Mrs. Parsons.....	Miss M. Parkinson.
Sandusk.....	Mrs. M. Deal.....	Miss Emma Pond.
South Cayuga.....	Mrs. B. Albright.....	Miss Eva Beck.
Caledonia.....	Mrs. M. Richardson.....	Miss F. Hudspeth.
Hagersville.....	Mrs. G. Beam.....	Mrs. J. Forman.
<i>Halton.</i>		
Moffatt.....	Mrs. Fletcher.....	Miss Cusick.
Milton.....	Mrs. Dr. Robertson.....	Mrs. S. R. Bews.
Appleby.....	Mrs. Porter.....	Mrs. Jas. Leonard.
Georgetown.....	Mrs. L. L. Bennett.....	Miss Pierce.
Acton.....	Mrs. A. F. Brown.....	Mrs. Geo. Havill.
Burlington.....	Mrs. E. J. Moore.....	Miss Jessie Edmonds.
Campbellville.....	Mrs. Samuel McDowell.....	Mrs. Robt. Menzies.
Palermo.....	Mrs. L. Hagar.....	Mrs. Dr. McCrimmon.

Name of Branch.	President.	Secretary.
<i>Halton.</i>		
Ballinifad .....	Mrs. B. Thompson.....	Miss A. J. McClure.
Trafalgar .....	Mrs. W. F. Brown.....	Mrs. A. A. Biggar.
Hornby .....	Mrs. Brownridge.....	Miss N. E. Lindsay.
Norval .....	Mrs. Francis Hunter .....	Miss Annie A. Noble.
Sheridan .....	Mrs. Geo. Hardy .....	Miss Bertha Andrew.
Nelson .....	Miss McLaren .....	Miss Mitchell.
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Foxboro .....	Mrs. A. Loucks.....	Mrs. L. Hubble.
Tweed .....	Mrs. N. J. McNair .....	Mrs. W. B. Huyck.
Melrose .....	Mrs. D. O. McArthur .....	Miss Nettie Ray.
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Springbrook .....	Mrs. Jas. McComb, Bellview.....	Mrs. Wm. Meiklejohn.
Queensboro .....	Mrs. Thos. Campbell .....	Mrs. R. S. Allen.
Wellman's Corners.....	Mrs. Robt. Totten .....	Mrs. John Snarr.
Fort Stewart.....	Mrs. Geo. Robinson.....	Mrs. E. T. Lumb.
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Harders .....	Mrs. S. Ketcheson, Sidney Crossing...	Mrs. G. Finkle, Sidney Cros'g
Turners .....	Mrs. J. Palmer, Chatterton .....	Miss B. Giffin, Holloway.
<i>East Huron.</i>		
Fordwich.....	Mrs. D. McLaughlin .....	Miss Margaret McKee.
Molesworth .....	Mrs. (Rev.) Jno. Burnett.....	Mrs. D. H. Campbell.
Ethel .....	Mrs. A. Lamont .....	Miss Nellie Laird.
<i>South Huron.</i>		
Bayfield .....	Mrs. J. Spackman .....	Miss M. E. Campbell.
<i>West Huron.</i>		
Holmesville .....	Mrs. W. Jenkins .....	Miss Emma Courtice.
Wingham .....	Mrs. Bone .....	Mrs. M. Q. Gillespie.
Clinton.....	Mrs. French .....	Mrs. F. W. Watts.
Goderich .....	Mrs. Levitt.....	Miss M. E. Salkeld.
<i>West Kent.</i>		
Port Alma .....	Mrs. G. H. Dawson .....	Mrs. J. R. Shanks.
Valetta .....	Mrs. Thos. Brown, Quinn .....	Miss M. Richards, Tilbury.
Wheatley.....	Mrs. Jos. Hickson .....	Miss I. LaMarche.
Irwin.....	Mrs. Jno. Lee, Chatham.....	Mrs. Thos. Irwin, Chatham.
Cedar Springs.....	Mrs. A. M. Hocking.....	Mrs. Jno. Rigby.
<i>West Kent.</i>		
Coatsworth.....	Mrs. Thos. Robinson.....	Mrs. Thaddeus Beno.
Tilbury .....	Mrs. I. Middleton .....	Mrs. Dugal Smith.
<i>East Lambton.</i>		
Forest .....	Mrs. Lawrie .....	Miss Sara Pettypiece.
<i>West Lambton.</i>		
Oil Springs.....	Mrs. Jno. Anderson.....	Mrs. Jas. Tichborne.
<i>Lincoln.</i>		
Grimsby .....	Mrs. Van Norman .....	Miss B. Beamer.
Beamsville.....	Mrs. Walter Tufford.....	Miss Clara McComb.
<i>North Middlesex.</i>		
Ailsa Craig.....	Mrs. Jas. Ross .....	Mrs. Wm. Bell.
Parkhill .....	Mrs. Dr. Kilborn .....	Mrs. P. Stewart.
Coldstream .....	Mrs. Godfrey NeGugan, Poplar Hill...	Mrs. F. Staples, Poplar Hill.
W. McGillivray .....	Mrs. J. Amos, W. McGillivray.....	Mrs. Wm. Weir, Brinsley.
Sylvan.....	Mrs. Whitelaw.....	Mrs. I. J. McKay.
Greenway .....	Mrs. Rob. English.....	Miss Myrtle Wickert.
Lobo .....	Mrs. P. L. Graham.....	Miss Ella Graham.
<i>West Middlesex.</i>		
Appin .....	Mrs. D. E. McAlpine.....	Miss J. Galbraith.
<i>Monck.</i>		
Winger. ....	Mrs. A. Coleman.....	Miss Florence Swayze.
Wellandport.....	Mrs. J. C. Flewelling.....	Mrs. W. T. Sutherland.
Smithville .....	Mrs. D. Zumstine.....	Miss Susie Adams.
<i>South Muskoka.</i>		
Brackenrig.....	Mrs. Wm. Trouten.....	Miss Edith Edwards.
Bracebridge.....	Mrs. A. Barron.....	Mrs. W. Holiday.
Germania .....	Mrs. J. Thompson.....	Miss J. Wise.
Baysville .....	Mrs. Richards.....	Mrs. May Schwoob.
Bardsville .....	Mrs. Austin.....	Mrs. R. Goltz.
<i>Centre Muskoka.</i>		
Allansville.....	Mrs. Amphlett.....	Miss Beatrice Proudfoot.



Name of Branch,	President.	Secretary.
<i>North Norfolk.</i>		
Tyrrell .....	Mrs. N. Buck.....	Miss May Blayney.
Windham, Centre.....	Mrs. A. S. Herron.....	Miss B. Robertson.
Courtland.....	Miss Harris.....	Miss Teeter.
<i>East Northumberland.</i>		
Brighton.....	Mrs. L. Sherman.....	Mrs. H. J. Scripture.
Castleton.....	Mrs. B. Welton.....	Mrs. C. E. Nichole.
<i>West Northumberland.</i>		
Hagerman's Cors.....	Mrs. Geo. Wragg, Port Hope.....	Mrs. T. W. Philp, Precious Corners.
Fenella.....	Mrs. J. W. Jibb.....	Mrs. M. Davey.
Gore's Landing.....	Mrs. Wm. Wood.....	Miss Tillie Fowlie.
Grafton.....	Mrs. J. W. Roberts, Wicklow.....	Miss Anna Crosjean, Brook- side.
<i>South Ontario.</i>		
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Greenbank.....	Mrs. Geo. Lee.....	Miss E. Miller.
Kinsale.....	Mrs. J. Sheldon, Greenwood.....	Miss F. E. Noble.
Whitby.....	Mrs. J. L. Smith.....	Miss O. Crawforth.
<i>North Oxford.</i>		
Kintore.....	Mrs. Pearson.....	Miss A. Henderson.
Thamesford.....	Mrs. Hogg.....	Mrs. J. W. McGregor.
Drumbo.....	Mrs. Bisley.....	Miss Baxter.
Hickson.....	Mrs. T. J. Loveys.....	Miss M. M. Tree.
<i>South Oxford.</i>		
Burgessville.....	Miss Lydia Cohoe, Norwich.....	Miss Susie Woodrow, Beaconsfield.
Tillsonburg.....	Mrs. Jansen.....	Mrs. W. D. Robertson.
Springford.....	Mrs. H. A. Shattuck.....	Mrs. A. Pratt.
Brownsville.....	Mrs. Jas. Esseltine.....	Mrs. W. A. Elliott.
Mount Elgin.....	Mrs. D. L. Phillip.....	Miss Flossie Harris, Verschoyle.
Beachville.....	Miss R. Downing.....	Miss Hasken,
Currie's Crossing.....	Miss Agnes Rice.....	Miss Ethel Siple.
Vandecar.....	Miss Elsie Davidson.....	Miss M. G. Kneale.
Folden's Corners.....	Mrs. R. G. Pullen.....	Miss V. Jarvis.
<i>Peel.</i>		
Alton.....	Mrs. W. Dorrington.....	Mrs. A. Wilson.
Brampton.....	Mrs. J. W. Smith.....	Miss Susie Campbell.
The Grange.....	Miss M. Bier, Erin.....	Miss B. L. Kirkwood, Rockside.
Bolton.....	Mrs. J. Fletcher.....	Miss L. Norton.
Streetsville.....	Mrs. R. Graydon.....	Mrs. D. Drinkwater.
Caledon.....	Mrs. D. Smith.....	Miss Hillyard.
Mono Road.....	Mrs. R. Hanna.....	Miss M. Donaghy.
Cheltenham.....	Mrs. W. W. Wilkinson.....	Mrs. F. Haines.
Inglewood.....	Mrs. Davidson.....	Miss E. Mitchell.
Malton.....	Mrs. Gardhouse.....	Miss A. Brocklebank.
Cooksville.....	Miss T. Pallett.....	Miss J. Ezard.
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Hampstead.....	Mrs. A. Forrest.....	Miss E. Fleischhauer, Gadshill.
<i>South Perth.</i>		
Tavistock.....	Mrs. V. Stock.....	Mrs. G. Kercher.
Staffa.....	Mrs. J. Hill.....	Miss M. Davis.
<i>North Renfrew.</i>		
Foresters' Falls.....	Mrs. P. R. Pounder.....	Mrs. D. J. McKillop.
Westmeath.....	Mrs. John Graham.....	Miss H. Carswell.
<i>Centre Simeoe.</i>		
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Wyebidge.....	Mrs. T. Robins.....	Mrs. J. Soden.
Lafontaine.....	Mrs. T. Elsom.....	Miss Alice LeCamp.
Wyevale.....	Mrs. W. Cameron.....	Mrs. T. Parnell.
Phelpston.....	Miss M. A. Loftus, Apto.....	Miss M. Schanahan, Anten Mills.
Minesing.....	Mrs. D. Wood.....	Miss Ada Livingstone.
Midhurst.....	Mrs. A. Coutts.....	Miss Estella Coutts.
Elmvale.....	Mrs. W. Malcolm.....	Mrs. W. H. Sparling.
<i>South Simcoe.</i>		
Churchill.....	Mrs. R. W. Sloan.....	Mrs. S. W. Moore.

Name of Branch.	President.	Secretary.
<i>West Simcoe.</i>		
Everett.....	Mrs. A. Kidd.....	Miss C. Jenkins.
Creemore.....	Mrs. F. E. Webster.....	Mrs. A. Watson.
New Lowell.....	Mrs. Switzer.....	Miss Macham.
Singhampton.....	Mrs. A. Buier.....	Mrs. Jamieson.
Duntroon.....	Mrs. Owens.....	Mrs. McGregor.
Sunnidale Corners.....	Mrs. Rose.....	Miss M. McLean.
Batteau.....	Mrs. Rupert.....	Miss Newell.
<i>Union.</i>		
Harriston.....	Mrs. Geo. Gray.....	Miss J. McCready.
<i>East Victoria.</i>		
Bobcaygeon.....	Mrs. Stewart.....	Miss Eva Bonnell.
Omeme.....	Mrs. Geo. McQuade.....	Mrs. Rogers.
<i>West Victoria.</i>		
Little Britain.....		Mrs. J. L. Rogers.
Oakwood.....	Mrs. R. G. Webster.....	Mrs. M. Webster.
Cambray.....	Mrs. W. G. Webster.....	Mrs. W. B. Feir.
Lindsay.....	Mrs. P. Milne.....	Mrs. F. Crandall.
<i>North Waterloo.</i>		
Wellesley.....	Mrs. J. W. Green.....	Miss Lucinda Bellinger.
Winterbourne.....	Mrs. A. Brown, Sen.....	Miss Ruth Pirie.
Hawkesville.....	Mrs. L. K. Weber.....	Miss Evelyn A. Lackner.
St. Jacobs.....	Mrs. C. Richmond.....	Miss Alice Brubacher.
<i>South Waterloo.</i>		
Galt.....	Mrs. Jas. Douglas.....	Miss Mabel Cowan.
Branchton.....	Mrs. Cam. Scott.....	Miss Ella Harvie.
Hespeler.....	Mrs. Thos. Shaw.....	Miss Mary Jardine.
Breslau.....	Mrs. A. C. Hallman.....	Miss Bergey.
Haysville.....	Miss Ida Walker.....	Miss Tye.
Preston.....	Mrs. B. W. Zeiman, Preston.....	Mrs. F. W. Cornell.
<i>Welland.</i>		
Sherkstone.....	Mrs. Amos Sherk.....	Box, 104, Preston.
Stevensville.....	Mrs. M. A. Baker.....	Miss Lillian Sherk.
Allansburg.....	Mrs. Thos. Stephenson.....	Mrs. J. H. Lubby.
Welland.....	Mrs. Phin.....	Miss Mae Ware.
Ridgeway.....	Mrs. J. F. Dunn.....	Mrs. Jno. Gaiser.
<i>Centre Wellington.</i>		
Belwood.....	Mrs. Dr. Dow.....	Mrs. Jonas Barnhart.
Marsville.....	Miss A. Woolner.....	Mrs. S. W. Broadfoot.
Erin.....	Mrs. A. Gale.....	Miss G. Preston.
Ospringe.....	Mrs. Hugh McCutcheon.....	Mrs. A. McKechnie.
Coningsby.....	Miss Bessie Thompson.....	Miss E. Baldie.
Orton.....	Mrs. A. Stephens.....	Miss M. A. McArthur.
Hillsburg.....	Mrs. Turner.....	Mrs. W. J. Roszel.
Bethany.....	Mrs. Thacker, Ponsonby.....	Miss Jean Turner.
Metz.....	Mrs. Povey.....	Miss M. Hall, Weissenburg.
<i>East Wellington.</i>		
Kenilworth.....	Mrs. (Rev.) Elliss.....	Mrs. Short.
Damascus.....	Mrs. H. Quinlin.....	
Grand Valley.....		Miss I. L. Farrill.
Arthur.....	Mrs. Wm. O'Neil.....	Mrs. A. Park, Hereward.
Conn.....		Miss A. Farrill.
Mount Forest.....		Miss M. Beckner.
<i>South Wellington.</i>		
Paisley Block.....	Miss M. McIntosh, Gourock.....	Mrs. G. L. Allan.
Rockwood.....	Mrs. Wm. Harris.....	
Aberfoyle.....	Mrs. Hammersley.....	Miss E. Cook.
Marden.....	Mrs. Jno. Kirby.....	Miss Mary Ord.
Kilean.....	Mrs. Cochrane.....	Miss Bella Smith.
<i>West Wellington.</i>		
Palmerston.....	Mrs. Jno. Oliver.....	Miss McLeod.
Moorefield.....	Mrs. Frank Short.....	Miss M. Murdoch.
Glenallan.....	Mrs. Wm. Slimmon.....	Miss G. McKay.
Alma.....	Mrs. Wm. Fairweather.....	Mrs. Ed. Tyack.
Drayton.....	Mrs. C. Cartrage.....	Mrs. Robt. Rumble, Jr.
<i>North Wentworth.</i>		
Westover.....	Mrs. Geo. Nicol.....	Mrs. Dr. Bright.
West Flamboro.....	Mrs. W. Betzner.....	
Lynden.....	Mrs. P. Hull.....	Miss B. M. Lindsay.
		Mrs. J. F. Thompson.
		Miss E. Harris.



Name of Branch.	President.	Secretary.
<i>North Wentworth.</i>		
Rockton.....	Mrs. Jno. Johnston.....	Miss B. M. Thompson.
Waterdown.....		Mrs. John Medlar.
<i>South Wentworth.</i>		
Carluke.....	Mrs. F. Reinke, Southcote.....	Miss J. Heuden, Conboyville.
Jerseyville.....	Mrs. Vansickle.....	Miss K. Petrie.
Binbroock.....	Mrs. Clough.....	Miss J. Brown.
Tapleytown.....	Miss S. Armstrong.....	Miss F. Pettit.
Glanford.....	Mrs. D. Reid.....	Miss E. Dickenson, N. Glanford.
Hannon.....	Mrs. C. E. Horning.....	Mrs. C. Glover.
Black Heath.....	Miss Hannon.....	Miss N. Blain.
Winona.....	Mrs. R. C. McKay.....	Mrs. A. B. Foran.
Stoney Creek.....	Mrs. J. W. Beaumont.....	Miss Clara Walker.
Ancaster.....	Mrs. Parker.....	Mrs. G. H. Horning.
<i>East York.</i>		
Thornhill.....	Mrs. Geo. Cooper, Willowdale.....	Miss Clara Clubine.
Box Grove.....	Mrs. N. E. Reesor, Locust Hill.....	Mrs. W. F. Reesor. Cedar Grove.
Markham.....	Mrs. L. Weber.....	Mrs. Jas. Wales.
Stouffville.....	Mrs. Geo. Brodie, Bethesda.....	Mrs. L. C. Wideman.
Agincourt.....	Mrs. W. A. Young, Ellesmere.....	Mrs. H. Thompson. Ellesmere.
<i>West York.</i>		
Maple.....	Mrs. Kirby.....	Mrs. W. T. Cook.
Klienburg.....	Mrs. R. Gibson.....	Mrs. E. Bray.
Woodbridge.....	Mrs. Farrand.....	Miss L. Duncan.

## NORTHERN INSTITUTES.

## DISTRICTS.

<i>Algoma Centre.</i>		
Goulais Bay.....	President.....	Mrs. F. McKaughan, Goulais Bay.
	Vice-President.....	Mrs. N. Downey, Goulais River.
	Sec.-Treas.....	Mrs. G. Robertson, Goulais River.
MacLennan.....	President.....	Mrs. John Armstrong.
	Vice-President.....	Mrs. W. A. Shier.
	Sec.-Treas.....	Miss Laura Napper.
South Tarentorus.....	President.....	Mrs. T. C. Dinsmore, Sault Ste. Marie.
	Vice-President.....	Miss L. Stewart, Sault Ste. Marie.
	Sec.-Treas.....	Miss. Kate Walker, Sault Ste. Marie, Box 568.
<i>Algoma East.</i>		
Alma Heights.....	President.....	Mrs. Chris. Bognell, Thessalon.
	Vice-President.....	Mrs. Wm. Mitchell, Thessalon.
	Sec.-Treas.....	Miss. L. Jack, Thessalon.
Livingstone Creek.....	President.....	Mrs. W. C. Walker.
	Vice-President.....	Mrs. J. D. McLellan.
	Sec.-Treas.....	Miss. M. M. Kinch.
Sowerby.....	President.....	Mrs. R. J. Cullis.
	Vice-President.....	Mrs. T. Greig.
	Sec.-Treas.....	Mrs. A. J. Bell.
<i>Manitoulin East.</i>		
Tehkummah.....	President.....	Mrs. J. McCutcheon, Sandfield.
	Vice-President.....	Miss. D. Hopkin, Tehkummah.
	Sec.-Treas.....	Mrs. Geo. Hutchison, Sandfield.
<i>Manitoulin West.</i>		
Gore Bay.....	President.....	Mrs. John McLaughlin.
	Vice-President.....	Mrs. W. W. Holden.
	Sec.-Treas.....	Miss. E. W. Ollerhead.
<i>Nipissing West.</i>		
North Bay.....	President.....	Mrs. J. F. Lage.
	Vice-President.....	Mrs. J. B. Overholt.
	Sec.-Treas.....	Miss. Howitt.
<i>Parry Sound East.</i>		
Arnstein.....	President.....	Mrs. Debarnardo.
	Sec.-Treas.....	Miss. A. Culen.

NORTHERN INSTITUTES.—*Continued.*

## Districts.

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Commanda	President	
	Sec.-Treas.	Miss Man.
Doe Lake	President	
	Sec.-Treas.	Mrs. R. J. Clark, Royston. P. O.
Emsdale	President	
	Sec.-Treas.	Miss Lean.
Golden Valley	President	Mrs. J. Matthews.
	Sec.-Treas.	Mrs. A. Shortland.
Loring	President	Mrs. J. Mathews.
	Sec.-Treas.	Miss Forsyth.
Midsouthian	President	
	Sec.-Treas.	Miss Emma Rousell.
Nippising	President	
	Sec.-Treas.	Mrs. Collin Campbell.
Powassan	President	Mrs. J. A. Porter.
	Vice-President	Mrs. W. H. Stewart.
	Sec.-Treas.	Miss S. McCaughey.
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	Vice-President	Mrs. Jas. Clugston.
	Sec.-Treas.	Miss M. Clugston.
South River	President	
	Sec.-Treas.	Mrs. Boorse.
Sundridge	President	
	Sec.-Treas.	Miss Bulmer.
Trout Creek	President	Mrs. T. F. Carr.
	Vice-President	Mrs. A. Booth.
	Sec.-Treas.	Miss C. McDonald.

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District Secretary.....Mrs. J. Phippen, Dryden.

*Rainy River South.*

District Secretary.....Mrs. A. C. Crosby, Fort Francis.

*St. Joseph Island.*

Richard's Landing	President	Mrs. J. Farey.
	Vice-President	Mrs. W. J. Armstrong.
	Sec.-Treas.	Miss L. Ferguson.

*Temiscamingue District.*

District Secretary.....Mrs. Wm. Kirstine, Haileybury.

*Thunder Bay District.*

Slate River Valley	President	Mrs. David Piper.
	Vice-President	Mrs. Dan McGregor.
	Sec.-Treas.	Mrs. Dr. Garver.
Murillo	President	Mrs. Robt. McKenzie.
	Vice-President	Mrs. A. Boulter.
	Sec.-Treas.	Mrs. J. McMahon.
Ouimet	President	Mrs. A. B. Holder.
	Vice-President	Mrs. G. C. Payton.
	Sec.-Treas.	Mrs. A. Snyder.
Hymers	President	Mrs. Hahn.
	Vice-President	Mrs. C. E. Hymers.
	Sec.-Treas.	Miss M. Brown.
Dorion	President	Mrs. H. T. Bryan.
	Vice-President	Mrs. John Edmond.
	Sec.-Treas.	Mrs. Wm. Morgan.

## BRANCHES.

Name of Branch.

President.

Secretary-Treasurer.

*Algoma Centre.*

## BRANCHES OF MACLENNAN.

Desbarats	Mrs. A. Reid	Mrs. W. C. Butterworth.
Echo Bay	Mrs. T. B. Perigo	Miss B. Spiers.



NORTHERN INSTITUTES.—*Concluded.*

Name of Branch.	President.	Secretary-Treasurer.
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## BRANCHES OF SOUTH TARENTORUS.

East Korah.....	Mrs. M. Spring, Steelton.....	Miss M. Watkins.
West Korah.....	Mrs. C. Nixon, Sault Ste. Marie.....	Mrs. H. Knight, Jr.

*Manitoulin East.*

Green Bay.....	Mrs. R. Summerville.....	Mrs. L. W. Ferguson.
Mindemoya.....	Mrs. Stocks.....	Mrs. Caddle.
Big Lake.....	Mrs. J. Hutchinson.....	Mrs. A. Trowbridge.
Little Current.....	Mrs. B. H. Turner.....	Mrs. R. Hay.

*Manitoulin West.*

Barrie Island.....	Mrs. N. E. Jennings.....	Miss M. E. McLean.
Grimesthorpe.....	Mrs. Palmer.....	Mrs. Jno. D. Coleman.
Ice Lake.....	Mrs. F. Grenville.....	Miss B. Laird.
Kagawong.....	Mrs. J. W. Foster.....	Miss Kathleen Wiber.
Poplar.....	Mrs. McGillivray.....	Miss M. Foster.
Barrie Island.....	Mrs. J. Jennings, Jr.....	Miss C. L. Greer.
Silverwater.....	Mrs. Wm. Clark.....	Miss Levia Smith, Fernlee.
Meldrum Bay.....	Mrs. O. Wright.....	Miss May Wickett.
Cockburn Island.....	Mrs. Ed. Smith.....	Miss Edith Monck.

*Rainy River North.*

Dryden.....	Mrs. Jno. Sanders.....	Mrs. J. Phippen.
Eagle River.....	Mrs. M. Hawse.....	Mrs. N. Lucas.
Oxdrift.....	Mrs. Alex. Beatty.....	Miss Ethel Salton.

*Rainy River South.*

Barwick.....	Mrs. Wm. Harley.....	Miss Martha Shaw.
Devlin.....	Mrs. Geo. Munn.....	Mrs. W. J. Thompson.
Emo.....	Mrs. Thos. McDonald.....	Mrs. T. A. Boucher.
Fort Francis.....	Mrs. Dr. Moore.....	Mrs. A. C. Crosby.
Rapid River.....	Mrs. A. J. Hunter, Sleeman P.O.....	Mrs. Geo. Sleeman, Sleeman, P.O.
Stratton.....	Mrs. J. Anderson.....	Mrs. Fred. Upton.

*St. Joseph Island.*

Carterton.....	Mrs. A. Kitchen.....	Mrs. Everett Crowder.
Harmony.....	Mrs. F. B. Kent, Richards Landing P.O.....	Miss A. Mephram.
Marksville.....	Mrs. A. G. Duncan.....	Miss C. Steinburg.

*Temiscamingue District.*

Haileybury.....	Mrs. C. C. Farr.....	Mrs. Walter Kirstine.
Hanbury.....	Mrs. H. R. Baker.....	Miss Olive Males.
Hilliardtown.....	Mrs. D. McNair.....	Mrs. A. T. Shelp.
Hillview.....	Mrs. Jas. Hall.....	Mrs. Wm. Fisher.
Judge.....	Mrs. E. Jones.....	Miss D. Littlejohn.
Milberta.....	Mrs. John Newton.....	Mrs. F. J. Armstrong.
New Liskeard.....	Mrs. John Sharp.....	Mrs. J. L. Brown.
Uno Park.....	Mrs. Jas. McFarlane.....	Mrs. J. T. Welbourn.

# Women's Institutes of Ontario

## ANNUAL CONVENTION

HELD AT MACDONALD INSTITUTE, ONTARIO AGRICULTURAL COLLEGE,  
GUELPH, DECEMBER 13 AND 14, 1905.

### OPENING ADDRESS.

By MRS. JAMES GARDNER, KEMBLE.

It was with timidity that I agreed to preside at this opening session of the annual convention of Women's Institutes of Ontario. I remember some years ago having just such a feeling as I have this morning, when the officers of our North Grey Farmers' Institute asked me what I thought of starting a Women's Institute in our district. After having the objects and possible benefits explained, I was pleased indeed at the prospect of having an Institute in North Grey. But when the day of organization came and I was elected president—greatly to my surprise and much against my will—I think I never felt more keenly in my life that I really did not know what to do. However, kind friends encouraged me by saying that if I would do my best they would stand by me. And as I look back I am so proud to see the way the women have stuck to the Institute work. And in the same way I sincerely hope that the delegates at this convention may sympathize with the efforts of the officers at the different sessions, so that this gathering may in every way be as successful as those which have preceded it.

I could not but appreciate and admire the arrangements of the convention last year. We had Mrs. Bews, of Halton, as presiding officer for the opening session, representing the largest Institute in the Province. Then we had Mrs. McNeilly as presiding officer at another session, representing the oldest Institute. But this year, when my turn has come to preside, that old feeling has returned, and I feel that I hardly know what to do.

It must be pleasing to our Superintendent to note the rapidly increasing membership, important development, and the improvement in regulations, which are going on under his management. Mrs. McNeilly said last year she thought he must be a very clever man to manage and control five thousand women, but this year he has undertaken over eight thousand.

Our Women's Institute seems to have brought about a great change in sentiment. I am doubtful if any two words in our English language have had such promotion during the past few years as "home-making" and "housekeeping." Economists tell us that "the homes of a nation are its strongest forts." We are learning through our Women's Institutes that housekeeping is not drudgery, unless we choose to make it so. Of late years, since domestic help has been so hard to procure, and wages have advanced so rapidly, many housewives have been compelled to do all their own work, and, when one would enquire of a friend as to how she was getting along, she



would perhaps acknowledge with reluctance that she was doing "all her own work," and in a tone that would indicate that she was owning up to poverty or something of the kind. But now a lady will announce with pride to her friends, without even being asked, "I am doing all my own work," and we never give the condition or circumstances a second thought. In most cases we would expect greater economy in the household when the mistress is at the helm.

We have adopted as our motto in North Grey, and have it printed on all our programmes, "If you know a good thing pass it on." There is another motto which we were taught at home, and which I have never heard anywhere else, so I will pass it on, viz., "A woman can scoop out with a spoon as fast as a man can scoop in with a scoop-shovel."

I think our convention of last year was a model Institute meeting. We learned of economy, patriotism, and perseverance. Economy was taught by Mrs. Bertha Dahl Laws, in her address on "Plain Food and Plain Living," wherein she urged that we aim to be more self-reliant and more dependent upon our own resources, and not buy, buy, all the time. And we learned of patriotism. I think before the last convention my patriotic spirit must have been quite normal, for when we would receive our American magazines, with the stars and stripes spread all over the covers, and nothing but fourth of July between; or when our American cousins would tell of their wonderful parades and demonstrations and fireworks (the fire-crackers being set off by the bundle and by the armful, and not singly as our boys do), I would lose patience and say it was all a waste of time and energy. But last year, you will remember, that Prof. Roberson, in the name of Sir Wm. Macdonald, presented these magnificent buildings—Macdonald Institute, Macdonald Hall and the Consolidated School—to the Hon. John Dryden, then Minister of Agriculture, to accept and maintain "for the cause of truth for its sake, for the good of mankind for their sake, and for the glory of God for the good of all," and he most gladly accepted and promised to support them for that end, I could not but feel proud of the land whose public buildings were built and maintained for that end, and wonder if this was one reason that this Dominion of which we are so proud, is so bright a spot in our mighty empire. My mind went back to the scene of that notable picture of the African enquiring of our late noble Queen what was the secret of England's greatness. You all know the reply. I will acknowledge to you all this morning, ladies, that I went out from this hall on that afternoon a new woman so far as a British subject is concerned.

We also learned of perseverance from Mrs. John Hoodless, when she related the history of our Women's Institutes from the inception, and told of the many discouragements and hindrances overcome. In many instances where she expected support and sympathy, she was looked upon as Institute crazy or as a woman with a hobby. Many ladies would ask her what she expected to get out of it,—a name, notoriety, money, or position. But though she expected to get none of these things she persevered, and showed herself to be one of those rare characters who surmount all difficulties. The Macdonald Institute is the result. If I remember correctly the closing remarks of Mrs. Hoodless brought forth more applause than any other address given at the convention.

I will now declare the convention open to proceed with the business as printed on our programmes.

## ADDRESS OF WELCOME.

By G. C. CREELMAN, PRESIDENT ONTARIO AGRICULTURAL COLLEGE, GUELPH.

Nothing could give me more pleasure than to welcome to the Ontario Agricultural College the delegates so largely represented here from the Women's Institutes of the Province of Ontario. I say this this morning with a very full heart, because I see before me the faces of women who are interested in women's work, in the advancement of women's work, and particularly in the special education for women which is provided in the Macdonald Institute. We have come to believe that the educational advantages that were considered essential for our sons are also essential for our daughters. And so perhaps for selfish reasons I am glad to see so many women here, because I hope to see this institution filled in days to come with your bright boys and girls. I shall look to you to take charge of the field work and ensure a large attendance.

For many years it was felt by the most advanced thinkers among the women of this country, Mrs. Hoodless and others, that the time had come when the government of this country should do something towards providing accommodation for the women and girls that they might be trained for their work or calling. Mrs. Hoodless, Sir William Macdonald, Dr. James Mills and Dr. James Robertson kept working away, until now we have located on the grounds of this college an institution which gives the girls an inspiration for their work and does not take them away from the farm or the home life on the farm. And you are here to-day to participate in the success of this movement.

Let us tell you that after all this was accomplished, and we had these fine buildings almost completed, Dr. Mills said to me, "We have got to this point all right, and we have splendid buildings, but do you think we are going to have anybody to put in them? Will any classes come to the Macdonald Institute to engage the attention of the teachers, or is it only talk throughout the country?" I said, "Well, Doctor, we will have to wait and see, but I believe that the agitation in the farm homes of this country is one that means something; it is one that is going to bring about permanent results; it is not talk and nonsense. The Women's Institutes are just beginning to wake up the women of this Province, and I believe when the doors are open we will have the building full." What was the result? The day that the Macdonald Hall was opened for the reception of students we had more than we could accommodate. We have 110 rooms and they were all filled. You would think that with so many ladies' colleges striving to maintain their position we would have had to advertise very widely to get enough students to even make a beginning! But not so. The growth has been steady. The statistics show that during 1905 we had in regular attendance at Macdonald Institute in domestic science work alone 296 girls. Does not that justify the expenditure of nearly \$200,000 that Sir William Macdonald gave for these two buildings, and also the expense of maintenance by the Ontario Government for all time to come? So that I feel that the attendance at least at Macdonald Institute is a settled fact for some years at least.

Now I wish to say to any of you here who are thinking of taking a course at the Macdonald Institute in the near future, or who have daughters, or sisters, or neighbors who are thinking of coming to this institution, that you must apply early. We have now to go to the other extreme. We are turning people away now. We shall soon have to demand in the name of the



Women's Institutes of Ontario larger buildings to accommodate your daughters and sisters.

As you go from room to room you will see in detail the work of the Macdonald Institute. We shall be glad to have any of you ask questions of teachers or pupils as to the working of the school. I may be biased to some extent on account of having the supervision of the work, but the girls are not at all biased and they will tell you the truth! The girls will tell you where the deficiencies are; they will tell you actual facts. They will tell you about the personnel of the teachers if you question them closely. You who come here and see the working of the institution must be our advertisers; you can say, 'I have read, and seen, and heard of the work they are doing and it is—or is not—being done to my satisfaction.' We are expecting you to assist us by your kindly criticisms in the matter of perfecting this course. Much has been done in two years. In an institution of this kind, which is necessarily of slow growth, we have made rapid progress. The teachers are thinking and planning and educating themselves along lines which will be helpful to the girls who are working with them. We are endeavoring to do three things well. We want every girl who goes through Macdonald Institute to be able to cook; to do good laundry work; and to do good, plain sewing. These three things, so essential in the everyday life of a woman, we must insist upon for every girl who goes through this institution. There are, however, many things which boys and girls get at college which are most important. The things I gained at the Ontario Agricultural College many years ago were things that were not on the curriculum. The mixing up of girls from different homes; the mixing with girls and having to give and take more than they do at home is a most important part of their education. We have had girls here who were "only" daughters, I would not say they were spoiled—no mother or father ever admits that he or she spoils a daughter—but they come to us with different ideas of life to the girl who had been one of a large family and who had been accustomed to a great deal of give and take. After a time at college the girl who has had everything her own way at home has received by contact with the college girls, a very necessary part of her education. We had one girl who had been to Paris and who had brought with her many beautiful clothes. She had not been here very long before she shipped home all these trunks to her mother and said, "There is no place for them at this practical institution, where we are learning to *do* things that are going to be helpful to us all our lives; no place for social rivalry and display." The average girl from the ordinary farm home has just as good an opportunity here no matter what her means may be as those who have more advantages in the way of wealth.

There are really four points in the work that you would be interested in.

(1) The short course, which has been patronized more particularly by farmers' daughters heretofore. I would like to sound a note of warning here. If a girl can do so it is much better to take the long course. If a girl selects the short course she is then out of running for the year's course; on account of the difference in the work which has been covered by the short course, she is not in a position to drop into either the one or two year courses.

(2) The course for home-makers. This is a one year course; for one who does not wish to teach but who wishes to prepare herself to keep house for herself or some other person. This course is very useful to a girl, and she can generally make it of great advantage in helping to save steps for her mother, and help her along right lines of improving her home. This course covers nine months.

(3) The Housekeepers' Course. This is for professional housekeepers; for those who believe this to be their calling, or for those who through change in circumstances in the home and so forth, wish to prepare themselves to take positions in our public institutions or elsewhere. There are many philanthropic and charitable institutions making applications to us for trained housekeepers.

(4) The Teachers' Course. This is a normal course extending over two years, and is open to those who wish to prepare themselves to teach domestic science in our public and high schools. I want to ask your sympathy and support to help in this movement to have domestic science, or household science, or home economics, or whatever you wish to call it, taught in every school in the Province of Ontario. Now this is no fad. A gentleman stood on this platform last year at the time of our short course in stock judging and gave our girls a talk on cutting up pork, beef and mutton in the home. He said that on Saturday evening just before he left home he was standing in a butcher shop, and saw a young man and his wife come in with a one year old child. They had come to purchase meat for their Sunday dinner. The wife said, "My dear, what shall we have for dinner to-morrow?" "Whatever you like," replied the husband. "Oh, I don't care; anything will do me." As they talked the butcher stepped up and asked what he might serve them, but they said, "We have not yet decided what we'll have." Finally they took a porterhouse steak at 22 cents per pound. Now let me tell you that sort of thing happens every day and every night. Why cannot people make up their minds what they want before they leave home? If men did their business that way we would never get along. We should make up our minds regarding all these matters and plan ahead. If a druggist neglected to put in a supply of drugs until he had a demand for them what would become of the folks with toothache and other ailments? There is too much of this hap-hazard way of doing housework which is not by any means the easiest way of doing it. The best way to overcome this is to start in the public school. Why the little girl with her doll and her mother instincts should not be started right along this line of simple planning and stitching and other things until she needs them; why a girl cannot be taught how to do laundry work for half an hour or so each week. I cannot see! Every girl is going to have something to do with these things sometime, somewhere in her life. I have seen the work carried on in our own consolidated school. The little girls are taught to dress their dolls and make their clothes from the same patterns as their mothers' clothes. The time to teach these things to our girls is during the years when their time is worth practically nothing. Let us help the girls in their earliest years to get the instruction which will mean the most to them in after life.

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## REPLY TO ADDRESS OF WELCOME.

BY DR. ANNIE A. BACKUS, AYLMER.

When we meet upon occasions of this kind it is quite as necessary for us to study our dangers and weaknesses as to seek out our progress and success.

One danger which threatens our individual, our domestic, and national happiness is selfishness. Commerce is the ruling passion to-day, and you know our fashions are set by those who rule; they are first adopted in the cities, then in the towns, then in the villages, and finally the country people take them up. And now it is the fashion to be utterly and completely given



up to self,—selfish amusements, selfish employments; employments and amusements that are a menace to our national and domestic welfare, giving a false perspective to life and life's meaning.

We read in our daily papers of the social events—afternoon teas, bridge parties, at homes, progressive euchre; we read of the beautiful gowns and wondrous table decorations,—and the result is unrest and a feeling in the hearts and minds of our country women and girls that they are losing something out of their lives worth having.

And then the men in the country, they read of fortunes made by some lucky speculation, they see pictures of well-dressed men in luxurious chairs talking fortunes out of a private telephone, and the farmer feels that he is wasting his talents, and the young men long for city life. Someway we cannot understand that this is mere "bluff;" we cannot believe that all these social functions are filled with jealousy and emulation, heartaches and weariness of the flesh. We cannot think that these men, sitting in their easy chairs and making such piles of money are really care-worn and anxious. And so we look at the mountain from afar and wonder at its "azure hue." But every woman who wins great social success, sacrifices more than she can ever replace. And every sudden fortune acquired, acquired except by honest toil, means that some one has been wronged, and the man who acquires it has no real joy in its possession.

Now, what we must realize is that the selfishness of the social and commercial world is destroying every chance of happiness for those who follow them; and we must also realize that in our country homes our boys and girls must be taught that the life that counts, the life worth living, is not to be estimated by social success or so-called "lucky" speculation.

Thus we come to the question of education,—and remember always that education is an entirely different thing from learning, and bears to learning the same relation that wisdom does to knowledge. Webster says: "Education is properly to draw forth, and implies not so much the communication of knowledge as the discipline of the intellect, the establishment of the principles, and the regulation of the heart." To think aright, to have established principles, with no compromise between right and wrong, a properly regulated heart, with no maudlin sentiment, but brave and true in right doing—this should be the basis of all education. And when this is the basis of education for our boys and girls, the social and national evils which have so alarmed moralists will slink away like wolves before the rising sun.

Thomas Henry Huxley writes:—"That man, I think, has a liberal education whose body has been so trained in youth that it is the ready servant of his will, and does with ease and pleasure all that, as a mechanism, it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength and in smooth running order, ready like a steam engine to be turned to any kind of work, and to spin gossamers as well as forge the anchors of the mind; whose mind is stored with the knowledge of the great fundamental truths of nature and the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions have been trained to come to heel by a vigorous will, the servant of a tender conscience; one who has learned to love all beauty, whether of nature or art, to hate all vileness, and to esteem others as himself."

So you see it is not learned men and women we need, but educated; not dreamers, but workers. The life that counts is the life that does things. Some one has said that Ontario has a splendid educational system, and so we take it for granted that such is the case. But is it? Are the things taught

in the schools those that go toward making great men and women? Practical men and women? Men and women ready to take up the duties of life with skill and thought? Do we find that the bright and shining lights of our schools and colleges become the bright and shining lights of the world? Do we find that the ability to memorize facts makes the hand skilful or the reasoning power accurate? Do we find our boys and girls coming home from school more ready and dexterous in the everyday duties of home? Would our school system not be improved by the introduction of more manual training, more physical development?

Now these are things about which we must think as well as about our fat stock. It is quite as essential that we raise well-bred children as well-bred horses. And you all know the care we give these beautiful creatures. The stable must be just right for the growing colt; it must have a level floor, lest the legs go under too far; it must be well lighted, for fear the eyes go wrong; the manger and feed boxes must be low, to develop the arch of the neck; the little fellow must not have too much clover hay, for that might spoil his wind; he must not be shouted at or punished, for that would spoil his disposition; if he acquired careless habits of standing with one foot over the other, that must be corrected by some mechanical contrivance. And all this is quite right, quite commendable. But when we go into the school house, do we find the same care and precautions to keep our children's bodies right? As a rule we find the ventilation bad, the chairs too high, and the desks too low; we find the children becoming narrow-chested and stoop-shouldered from this cause,—and we do not find a mother's name upon our school boards. But it is the mothers who, if they were given the right, would insist upon proper sanitary arrangements for the physical welfare of their children.

However, I am not here for the purpose of making a speech, but to thank Mr. Creelman and the people of Guelph for their gracious welcome to us, the delegates of the Ontario Women's Institutes, and to try to express our pleasure and gratification for this meeting in the hall of this beautiful building.

Who says the days of chivalry are past? The knight who founded the Macdonald Institute has overthrown more enemies for women than all the plumed knights that ever rode to battle, and we are proud of the just and generous men of Canada who have made it possible for us to meet here to-day. Our dearest wish is to prove ourselves worthy of their trust and confidence. And may we, as delegates, behave so circumspectly, that when we take our leave Mr. Creelman and the people of Guelph may say as did the little girl when opening the door for the mother's departing guest. When he apologized for troubling her, she said, "Oh, I am only sorry I am not letting you in."

#### ADDRESS.

By SUPERINTENDENT G. A. PUTNAM, TORONTO.

I cannot adequately express the gratification it gives me to meet so many representative delegates from the Women's Institutes scattered over this fair Province, delegates who are truly representative of this powerful organization for good among the rural population. I hardly expected to see so many here to-day, and it speaks volumes for the future of the work when we consider that you are not from any one section of the Province, but nearly all districts are represented, and that by women who have, in many cases, made a personal sacrifice in coming to this convention, thus



showing that you are deeply interested in the betterment of home conditions throughout your respective districts. What is of greater importance than that the home life of this Province should receive the closest study and consideration on the part of those who are responsible for the character of the same. Are the farmers of the Province studying the best methods in their occupation and keeping cattle, hogs and other stock that will give the greatest percentage of profit, just to keep the wolf away from the door and to accumulate money to be left to their descendents, or are they putting forth these efforts in order that the home life may be fuller and conducive to the more complete happiness of its members? Is it not true that the cattle we keep, the grain we sow, the fruit we produce, are tributary to the more essential interest of the farmer—the home. The horses and cattle and crops do not constitute ‘home’ except in so far as they contribute towards the pleasure we get from a closer contact with nature and increasing the income of the household. Do we ever stop to consider the majesty of the growing grain, the flower, the budding trees, or the young animals coming to life about the farm? We sometimes become so engrossed with the numberless tasks bidding us to be up and doing that we forget everything but the monetary consideration, and our occupations become nothing more to us than the daily grind of the average corporation laborer. There is much in farm and village life which is pleasing, entertaining and ennobling, and the surroundings are conducive to the realization of that which is highest and best in the child and the man. Let us do what we can to see that all may have an opportunity to participate in the good work which our organization has the opportunity of carrying on.

President Creelman has just referred to the “students” of the Macdonald Institute, and last night he referred to the “ex-students” of the Ontario Agricultural College. I have pleasure in addressing you, not as ex-students but as students and teachers. You are meeting to study those conditions which will mean the improvement of our homes, and each member has the privilege of being a teacher and the opportunities of a student. We, as Canadians, have received with much gratification within the past two or three years the commendation of the Mother Land and other countries for the successes we have attained. Not only in our own country, but in all lands where they have gone, do Canadians hold prominent places in the social, industrial, educational, and political life of the state. They are specially prized in the United States; if you let it be known that you are a Canadian you will have a double welcome in most parts of the Union. It is claimed and claimed upon good ground, that one of the reasons why Canadians have achieved such marked success is that the home life of our country has been pure and tended to the building up of a strong and vigorous manhood,—morally, mentally and physically.

The members of the Women’s Institute as well as others who are interested in the welfare of the nation, have a responsibility resting upon them in this matter. It is stated that our much prized home life is gradually slipping away from us. I trust that the members of our organization will see to it that the work undertaken in the various Institutes will be towards the strengthening of home ties and the enlistment of all the members of the household in that mutual consideration and thoughtfulness which cannot but result in the furtherance of that which is noble and true. It remains with you ladies to say whether this home life is to depart from our Canadian National life. It will not, if you say it must remain.

What is the meaning of a convention like this, so representative in its character? It means that we are giving the people of this Province an

opportunity for the home-makers to come together upon a common ground and discuss subjects of mutual benefit and interest. That is a privilege which has not hitherto been enjoyed to the full by the housekeepers and home-makers of the country. There are farmers' wives and some towns people who have no opportunity for meeting with their neighbors or the persons living on the next concession for intercourse of either a social or business nature. It is also true that many women, and especially farmers' wives, are a little independent and are apt to say "I will not be the first to make advances." We have in the Women's Institute an organization which permits of all women of the community meeting with a common object in view, no class, church or national distinctions being drawn. I have heard no plausible argument put forth why this organization should not meet with continued success. Its aims are most liberal, its objects helpful, and the subjects for discussion unlimited; and when it appeals to the intelligent persons of the community, as it has in the past, and conducts works of interest and benefit to all, even those who have not had the advantages of a good early education, there can be no doubt of the success of the work, if only those who are appointed to office have the time to devote to the work.

You would be very much surprised if you were in my office to look over the reports received from day to day of meetings held in different sections of the Province. One of the most gratifying things in connection with this work is that the officers and members search out subjects and prepare programmes for themselves, selecting those topics which they believe to be best suited to their particular localities. It is a very hopeful sign when we see the officers and members becoming less and less dependent upon the Department for direction and assistance. I have observed that the Institutes which arrange and carry out their own programmes without outside assistance are the ones which are doing the best work. Do not understand me, however, as advising that you should be entirely independent. It is well to invite your neighboring Institutes to assist you at your meetings, but only upon the understanding that their efforts will be reciprocated.

One of the presiding officers at this convention stated that it was not the main object of this Institute to teach members *how* to do this or that but to teach them *what* to do. It brings to the attention of the fathers and mothers the fact that as heads of the household, they have responsibilities to their families; and when you find a parent or guardian awake to this responsibility you may rest assured that they will have no difficulty in finding ways and means for putting into practical effect their convictions as to this responsibility. Some of us are so busy, so taken up with the daily routine, and in "making more money to buy more land, to grow more corn, to feed more hogs, to get more money" and so on in an endless chain, that we forget we owe a duty to our children beyond merely providing for their sustenance; that the children should receive character training and opportunities for culture. Of course so many fathers and mothers are so busy that they sometimes forget to teach and advise the children as to morals and culture. There is a duty resting upon the parents in this respect, and if they cannot devote the necessary time to the task, they should provide the facilities that the children may receive the necessary training. Do not forget President Creelman's advice in this matter.

I shall not detain you long for the reason that this convention was called chiefly that the delegates might discuss subjects which are of vital interest to them, to decide upon some line of work which shall be for the betterment of the organization. You will please bear with me, however, while I give you a few figures as to the



*Growth of the Work.*

You are all familiar with the growth of the work from a small beginning in the 90's to a membership of 3,081 and an attendance of 16,410 for the year ending with June, 1902. At the present time we have a membership of close to 9,000, with an attendance during the year of over 54,000. Seventy District Institutes have been formed and about 250 branches are carrying on aggressive work.

It is most gratifying to get encouraging reports from the officers who have been in the work for some years as well as those who have been connected with it for only a short time. They are generally enthusiasts and are doing all they can to advance the work. It is to the officers largely that we owe the splendid growth of the work. Then the official organ has helped materially in carrying on the work successfully during the past year.

The special character of the work undertaken by Women's Institutes is one of the reasons for the progress the work has made. When we send a delegate to a Farmers' Institute meeting he usually talks on some special line,—dairying, cultivation of the soil, the bacon hog, management of horses, etc.; and you can readily understand that only a limited proportion of an audience of farmers will be particularly interested in the subject under discussion. The farmer who raises beef cattle is not usually interested in the bacon hog, and the dairyman does not usually take much interest in the discussion of subjects relating to horses. But when you come to a Women's Institute meeting you will find that nearly all women will be interested in the discussion of any subject pertaining to home life and work. That is one of the chief reasons for the general interest taken in the work.

Do not allow a small attendance or a low membership to discourage you in the beginning of the work. Many officers who are now at the head of thriving institutes have stated to me that during the first one or two years they had almost vowed they would not try to continue the meetings, but by persevering they found later that their neighbors had come to appreciate their efforts.

I wish to express my sincere gratification at meeting such a large number of representative ladies from the length and breadth of the Province. You really seem like one of the family because I have corresponded with most of you throughout the year. I wish you to consider this your convention, and when the proper time comes express your views and present your difficulties, and the result will be a helpful and profitable conference.

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## THE WOMANLY SPHERE OF WOMAN.

BY MISS LAURA ROSE, GUELPH.

Everybody is willing to admit that woman's rights are practically won. Except that she is excused from a few formal political duties, she can have anything else she wishes.

The problem we propose discussing is, What does woman really want? What is her proper and congenial sphere?

For years past the press, the pulpit, and the platform have been discussing the equality of man and woman,—their equality of education, their equality for all social and business positions, their equality of remuneration

for service rendered of equal merit. This agitation has resulted in that now woman takes her place beside man in almost without exception, every walk in life. Whether these changes of opinion in regard to the enlargement of the sphere of woman and the results they have brought about are all that could be desired, form a question about which there might be much grave discussion. The tendency has been to narrow down the distinctions between man and woman, but the true womanly ideal is to keep them wide, as the Creator of all meant that they should be.

I fear that some of the views which I may express may to this audience of energetic, progressive women, seem like retrogression instead of progression, but I have thought much and observed more along these lines, and believe that the thinking women of to-day will agree with me, and I am still surer of the support of the men.

When God instituted the first household He installed Adam as the bread-winner—the producer; and Eve as the home-maker—the dispenser. Relationships between man and woman have not changed, but conditions and environments have made the woman in a broad sense equal to man and have brought about complicated social problems. The mere fact that five million women in the United States earn their own living, and that one-half the women over fifteen years of age are unmarried, make us pause to think, Why is it thus? Why? Largely because woman has ceased to be the director of the production of man, and has taken the reins into her own hands and become less reliant on the labor of man.

It used to be that the daughters remained at home to care for the younger brothers and sisters (now there are no younger brothers and sisters) and assist the mother with the sewing, mending, baking, washing and ironing, and they were happy and content in their simple, quiet, busy life, and at an early age married and in their turn became the centres of equally happy, thrifty households. In a few of our rural districts these conditions still exist, but how much oftener we find the daughters leaving the farm home to seek some position in a city; or if their home be in a town, going each morning to the office or factory. As a consequence, to lessen the housework, the clothing is bought ready-made, the bakeshop furnishes the larder and the public laundry cares for the clothes. The girls, if they do not have to assist in defraying the household expenses, spend their money mainly on dressing themselves very much more extravagantly than their fathers could afford to do, and indulging themselves in luxuries. The young men friends of these girls receive little if any more salary, and to keep pace with them have little chance to lay by money to establish a home such as these same girls expect and almost demand. And so the years in which a young girl dreams dreams and a young man's fancy lightly turns to thoughts of love, are frittered away in what is called "having a good time," until we find that the daily grind of the treadmill has left its lines on the once fair face of the girls, and the young man has settled down a confirmed old bachelor in some comfortable quarters.

Earning one's living engenders a spirit of independence in a woman, which does not tend toward matrimony, yet "maids must be wives and mothers to fulfil the entire and holiest end of woman's being." True there are many women placed in circumstances which make it necessary to do for themselves and often help to support others. These same women are the very salt of the earth, and their very maidenhood may have its hidden story of great sacrifice.

There are many womanly avocations or spheres which woman may enter and lose none of those gentler traits which are her chief charm, such,



for instance, as teaching, nursing, the practice of medicine, administering to the destitute in mind and body, stenography, retailing in small commodities, working for wages in the home and shop, and other kindred callings.

Productive industry on a large scale is rather to be shunned. Competitive conditions are so keen and the world forces so strong that the finer nerves of woman cannot stand the strain. It is well to leave this sphere exclusively to man, who can better contend with dishonest contractors, striking workmen, incompetent agents, corrupt politicians, and fickle customers. For the strenuous business life, and the mental and emotional attitude it requires, woman is fortunately unfitted. The quick decisions, tremendous ventures, overwhelming failures, and unexpected successes incident to a large business career, can only be met and borne by the stronger fabric found in man's mental and physical constitution.

If a rare exception shows a woman has entered this field and has been a financial success, a more thorough investigation may reveal that the success has made her a nervous wreck or has petrified all that was gentle and lovely in her nature,—conditions more to be regretted and vastly more pathetic than financial failure.

Let us safeguard well the differences in our natures, which make men seem our superiors, and yet which, if neutralized, would rob us of our greatest good. We do not add anything to the beauty of two mounts by filling in the valley between, but only by so doing make of them a monstrous plateau. Our first and last thought should be "Let us be womanly."

I strongly believe in a good elementary education for all girls, and the higher education for the girls who have a good physical constitution and whose parents can afford the expense of sending them away to school. In acquiring knowledge girls have shown themselves to be quite equal to boys, and the test examinations very often show that a girl's name heads the list. Usually a girl does not need so much spurring on to study as a boy; in plainer language, she is not so lazy and should rather be checked than urged. Often her ambition to come out head puts her under such a mental and physical strain, that when the day comes that she receives her certificate or diploma, it finds her completely shattered. She has won her laurels dearly, she has attained honors,, but has gotten in exchange for her robust figure, muscular flabbiness, and for her merry face, sharp-featured irritability. Thousands of our brightest and best young women are sinning against themselves and future generations by over-study. We must safeguard our health and look upon it as our most valuable asset.

By choosing a purely literary career we have, to a large extent, to exclude ourselves from the lighter and more joyous phases of life, and often grow what men term "peculiar." I would say let the men grope among the deeper sciences, and let the women remain content with reading about the wonderful discoveries. It is most comforting to come to the conclusion that it is not necessary to know everything in order to live.

I am treading on dangerous ground, but I am going to be fearless, I am going to say that our girls have been in their education taken too much from the home and its interests. The young girls go from the public school to the collegiate, and the list of studies is so long and hard that every spare minute she is under the parent roof she is pouring over books or practicing at the piano. From the school she takes some position and the training all through has been toward weaning her away from the home life and house work. She frankly admits she does not know anything about it. We hear the cry, "What can we do to keep our boys on the farm or turn them again

to the land?" But the silent cry that is ringing through our country is, "What can we do to keep our girls in the *kitchen*?" My greatest hope in the good work the Macdonald Institute may do is that it may turn the young women back to home life, and that their true pleasure will be found in administering to the comfort of the inmates of their own homes, as Milton says—"for nothing lovelier can be found in women than to study household good."

It is these "home" girls which prove particularly attractive to young men. These girls usually have less spending money; they are more economical, and have a sensible view of life, and their daily round of duties constantly directs their minds towards founding a similar home.

Some woman in writing said she did not see why so many women took up with such inefficient men, and the only reason must be that there were not enough efficient ones to go around. "Just anything" in the way of a man will not answer in this age, and if men only knew it, that is why they do not get married and why in consequence we have so many women single. If we wish to make home life the ideal sphere of woman, we must endeavor to persuade the young men to make more of their opportunities so as to become fit and congenial companions for these educated, cultured girls. It is not the man who earns the largest salary, but the man who shows himself considerate, obliging, thoughtful and devoted, as well as intelligent, who wins a true woman's heart.

It must not be inferred that every woman who assumes the responsibility of looking after a man and a home is doing her full duty toward the world and has dropped into her proper sphere. Many a woman only becomes a millstone around her husband's neck, and by her extravagance drags him to the brink of bankruptcy or suicide, or by her jealous and dissatisfied disposition, or the constant reiteration of the petty trials and cares of the day, drives her husband from the shelter of his own home to seek more congenial surroundings in the club room or public house. It may not be a difficult matter to win a man's affections, but to keep the fire of love brightly glowing on the hearthstone of his heart, requires the faith of an Abraham, the patience of a Job, the demonstrativeness of a Peter, the love of a Mary, and the cooking qualifications of a Martha.

Very often a married woman neglects her home, her husband, and her children, by taking too active an interest in public work or social functions, and falls far short of the ideal she is holding up to others. On the other hand a woman becomes too narrow if the four walls of her home compass her only world, her sympathies must be enlarged, her judgments softened, her charity stimulated by coming in contact with the grave problems which confront her less fortunate sisters. Still it appears to me that the most active members of all our philanthropic, missionary and benevolent societies, should be the maiden ladies whose home ties are such that there is no thought of neglect of duty if they are frequently seen on the street when the bell rings six o'clock, or are out night after night attending meetings.

It seems to me that a mother is making an unnecessary sacrifice for the betterment of the world or her own personal pleasure when she leaves the proper—but more likely improper—feeding of her family to hired help, and deprives herself of hearing the evening prayer lisped and getting the big hug and warm good-night kiss of the little ones in the cot.

Pure, simple, loving home life is the only firm foundation upon which a nation can build a lasting structure. It is the women who are largely responsible for the standing of the home. A woman, if she is being a lov-



ing and true wife, and a devoted, intelligent, righteous mother, need have no regrets that academic honors, high social position, or political privileges have been denied her. She is filling the womanly sphere. The eyes of the world and of the God above rest with favor upon her, and her reward in the hereafter is sure.

## PATENT MEDICINES.

BY DR. HELEN MACMURCHY, TORONTO.

What do people take medicine for?

An old lady, the widow of an officer in the British army, died in 1904 at St. Leonards', England. The "London Daily Mail" states that an inquest was considered necessary. The evidence brought out at the inquest elicited the fact that she "disliked doctors," but was in the habit of taking every night.—

Nine compound rhubarb pills.

Several mixtures.

Four tablespoonfuls of senna.

Three teaspoonfuls of cascara.

A quantity of magnesia.

There are a good many people like the old lady. Most of them are probably not really sick, but they are uncomfortable. Why are they uncomfortable? When our beautiful and beloved Queen Alexandra, then Princess of Wales, was out walking one day near Sandringham she met a young British subject, roaring and crying, accompanied by a stolid British nursemaid. The gracious lady stopped and enquired the cause of the child's woe. "Ma'am" said the maid, not knowing to whom she was speaking, "there aint no stomach can't stand nine buns." That is the reason that some people are uncomfortable. They eat too much. Or they eat too fast. It is somewhat the same thing. People who will slowly and thoroughly masticate their food, satisfy their needs far better than those who take a potato in two mouthfuls. Sooner or later those who bolt their food and eat too much will have indigestion and will be uncomfortable, and they deserve it. Or perhaps they do not take enough fresh air or enough exercise, and want some medicine that will enable them to go on doing these things and yet be comfortable.

The celebrated Dr. Abernethy had once a very rich patient, who drove in his own carriage behind two horses and two men, his coachman and footman. He ate too much and took too little exercise. So the great and gruff Dr. Abernethy gave him a prescription. The prescription was that he was to get out of his carriage and run behind it. And he did it. Dr. Abernethy was one of the great doctors. You had to do what he told you. But that is not a favorite prescription. That is not the medicine that people want. You have a headache and it is your own fault. But it is a great deal easier to swallow pills than to mend your ways and take exercise, or eat slowly, or go to bed earlier, or worry less.

Now this is a wrong and foolish use of medicine,—to do something you should not do, and then dose yourself to make up—but it is a very common one. It is not only a wrong and foolish use of medicine, it is dangerous. Self-dosing is dangerous, especially with Patent Medicines.

## G—— IS INSANE, HIS FRIENDS SAY

The L—— Man Who Killed  
His Wife in Detroit has been  
off His Head.

L——, Ont, July 15, 1905.—D——  
G——, who killed his wife in Detroit  
yesterday was a son of Mr. M—— G——  
of —— street, and his wife, whose  
maiden name was J—— D——, also lived  
here, both belonging to highly respectable  
families. G—— did well in business, but,  
being attacked with rheumatism, he took  
a variety of patent medicines, which, the  
doctors say, worked on his brain, and he  
was sent to a sanitarium. Here he im-  
proved so much that three weeks ago he  
was allowed to come here and attend the  
funeral of his father-in-law, T—— S——.  
Then G—— rejoined his wife and they  
went back to Detroit. While here G——  
showed evidences of insanity, but his case  
was not considered serious.—*The Toronto  
News.*

## H—— NEWS.

Death of Miss J—— B—— After Tak-  
ing Headache Powder.

(Special Despatch to The Globe.)

H——, June 26, 1905.—Miss J——  
B——, second daughter of Mr. W——  
B——, died suddenly yesterday afternoon  
from the effects of a headache powder.  
The unfortunate young lady, who was  
about 22 years of age, was found by her  
mother unconscious in bed ten minutes  
after having taken the powder, and medi-  
cal assistance was at once sent for. Miss  
B—— lived only about half an hour, and  
did not regain consciousness. The young  
lady had been out in the morning with  
her mother.

Here is one more example from Great Britain. On May 17th, 1905, Mr. Sheppard, of Stoke-Newington, England, obtained a free sample bottle of Liquozone. He took some himself for the relief of hæmorrhoids from which he suffered, and gave some to his wife to cure her of neuralgia, without any success in either case, and Mrs. Sheppard then proceeded to dose her two little girls, Constance Adelaide, aged four years, and Dorothy May, aged two years. She thought they needed it, although they were well. They did not remain well long. Constance was taken ill on May 24th with severe diarrhoea and vomiting



and died on May 23rd. Dorothy was attacked with the same symptoms on May 22nd and died on May 25th. Of course, there was an inquest. Here is the verdict of the coroner's jury:

"Both the children died from exhaustion after vomiting and diarrhoea, set up by taking Liquozone."

And here is the evidence of Sir Thomas Stevenson, the celebrated English chemist, one of the witnesses at the inquest:

Analysis of Liquozone:

Sulphur dioxide.....	0.269 per cent.
Sulphuric Acid.....	0.848 per cent.

Practically a solution in water of sulphur dioxide.—*The Lancet*, June 10th and July 1st, 1905.

That is, Liquozone is 99 per cent. water.

The danger to life and health of taking patent medicines is beginning to be recognized. In the *Insurance Advocate* for January, 1902, it is stated that one insurance company requires its medical examiners to ask candidates for life insurance, "What patent medicines have you used in the last five years?" And some druggists are refusing to sell patent medicines.

A Canadian druggist writing to *American Medicine* says: When anyone comes in and asks for a bottle of these swindles, I always give them what they ask for, but usually with my opinion of the fraud thrown in. In certain cases it is useless to do this, as it has no effect. I am thankful to say, however, that I have been instrumental in stopping the sale of hundreds of bottles of these frauds."

## A WINDOW EXHIBIT IN A CHICAGO DRUG STORE.

THE ECONOMICAL DRUG COMPANY OF CHICAGO.

PLEASE DO NOT ASK US

What is

ANY OLD  
PATENT  
MEDICINE

Worth?

*For you embarrass us, as our honest answer  
must be that*

**IT IS WORTHLESS**

*If you mean to ask at what price we sell it,  
that is an entirely different proposition.*

*When sick consult a good physician. It is the  
only proper course. And you will find it  
cheaper in the end than self-medication  
with worthless "patent" nostrums.*

—Collier's.

Dr. Nasmith, who is investigating the subject for the Provincial Board of Health, says that at Niagara Falls there is sold, especially to the negroes, a good deal of Dr. Agnew's Catarrh Cure. This contains cocaine—a most dangerous drug,—valuable in its place, but never to be taken without a doctor's prescription. A cocaine fiend is far worse than a drunkard—far worse than a morphine fiend, even. He cannot sleep, cannot eat, cannot work, cannot think, cannot do anything that a man or woman ought to do.

## WHAT DO PATENT MEDICINES CONTAIN ?

- These facts lead up to the questions (1) What do Patent Medicines contain?  
(2) When you buy Patent Medicines do you get the worth of your money ?

### I. Patent medicines contain

1. Alcohol.
2. Bread, sugar, soap, salt, water.
3. Drugs found in every drug store and known and used by every physician, none of which are safe for general use, except by medical advice, and some of which are very dangerous.

Those patent medicines advertised for the relief of pain generally contains opium, morphine, cocaine, etc. Headache powders and headache tablets usually contain heart-depressants, such as anti-febrin or antipyrin. Tonics, bitters, etc., nearly all contain alcohol. A reference to the following tables will show the contents of a good many patent medicines.

## APPROXIMATE INGREDIENTS OF VARIOUS PATENT AND PROPRIETARY PREPARATIONS.

From a lecture on Patent Medicines, delivered at the London Hospital Medical College on November 10th, 1903, by Robert Hutchison, M.D., Edinburgh, F.R.C.P., London.—*The Lancet*, Nov. 28, 1903,

### APERIENT AND LIVER PILLS.

*Beecham's Pills*: Aloes, ginger and soap.

*Baillie's Pills*: Aloes, colocynth, oil of cloves and soap.

*Bile Beans*: Cascara, rhubarb, licorice and oil of peppermint, coated with gelatin.

*Cockle's Pills and Barclay's Pills*: Aloes, colocynth and rhubarb.

*Carter's Little Liver Pills*: Podophyllin (one-eighth grain) and aloes soc. (one-third grain) in each pill.

*Dixon's Pills*: Taraxacum, podophyllin, jalap and soap.

*Holloway's Pills*: Aloes, rhubarb, saffron, Glauber's salts and pepper.

*Page-Woodcock's Wind Pills*: Aloes, oleum carui and soap.

*Scott's Pills*: Aloin and cascara, with a soap basis.

*Whelpton's Pills*: Rhubarb, aloes, ginger, pulv. ipecac and soap.

### SALINE APERIENTS.

*Eno's Fruit Salt*: Bicarb. soda, tartaric acid and citric acid.

*Lamplough's Pyretic Saline*: Citric acid with bicarbonate of potassium and sodium

*Abbey's Salt*: Tartaric Acid with bicarbonate of sodium, sulphate of magnesium and sugar.

### COUGH MIXTURES AND LOZENGES.

*Congreve's Elixir*: Benzoic acid, infusion of elderberries, alcohol and allspice.

*Keating's Cough Lozenges*: Ipecac, lactucaria, squill, licorice, tragacanth and sugar.

*Unbridge's Lung Tonic*: Balsam of tolu, oil of aniseed and oil of cloves.

*Balsam of Aniseed*: Contains aniseed and other ingredients with one-tenth grain of morphine in every ounce.



## PREPARATION FOR GOUT AND RHEUMATISM

*Eade's Pills*: Salicylate of sodium, guaiacum and aloes.

*Gloria Tonic*: Colchicum, guaiacum resin and iodide of sodium

*Blair's Gout Pills*: The active ingredient is colchicum.

## PREPARATIONS FOR HEADACHE AND NEURALGIA.

*Antikamnia*: Bicarb. of sodium, antifebrin and (?) caffeine.

*Bromidia*: Bromide of potassium, chloral, hyoseyamus, cannabis indica, oil of aniseed, syrup and water.

*Bunter's Nervine*: Creosote, chloroform, camphor, balsam of tolu and alcohol.

*Kaputine*: Antifebrin and sugar (colored).

*Kay's Tic Pills*: Sulphate of iron, quinine and soap.

## PREPARATIONS FOR ASTHMA.

*Crevoisier's*: Belladonna, foxglove, stramonium, sage and nitrate of potassium in equal parts.

*Hair's Cure*: Iodide of potassium and tarwater.

*Plant's Cigarettes*: Leaves of stramonium, lobelia and green tea.

*Tucker's Cure*: Atropine, cocaine, hyponitrous acid, and various balsamic extracts, administered by means of an aeriser.

## REMEDIES FOR OBESITY.

*Trilene Tablets*: Sugar and a vegetable constituent of unknown nature.

*Grey's Specific*: Contains 47.2 per cent. of free sulphur and a bitter (? gentian).

*Mrs. Frost's Anti-Obesity Remedy*: The active ingredient is extract of fucus vesiculosus.

*Russell's Anti-Corpulent Cure*: Citric Acid (20 grains to half an ounce) glycerin and water. The Pink Tablet-Saccharine.

## MISCELLANEOUS PREPARATIONS.

*Buer's Piles Cure*: Ointment—gall and hamamelis with lanolin basis. Powder: Precipitated sulphur and carbonate of magnesium.

*Californian Syrup of Figs*: Senna (active constituent), syrup of figs and cinnamon.

*Doane's (Backache) Pills*: (1) White coated aperient (dinner pills) podophyllin, aloin, rhubarb and peppermint. (2) Brown-coated (Backache Pills)—Oil of juniper and resinous constituent (? benzoin).

*Guy's Tonic*: Phosphoric acid, tinct. cochineal, infusion of gentian and chloroform water.

*Dalby's Carminative*: Pulv. rhei, magnes. carb., glycerin, sugar, ol. menth pip, and ol. anethi, and a small quantity of laudanum.

*Chlorodyne*: Chloroform, ether, hydrocyanic acid, morphine, cannabis indica, capsicum, peppermint and treacle.

*Clarke's Blood Mixture*: The active constituent is iodide of potassium. (about six grains to an ounce).

*Oxien*: Powdered sugar and starch and ol. gaultheriae.

*Ozerine*: Bromide of potassium and iodide of ammonia, with chloroform water.

*Phosferine*: Quinine, phosphates and hypophosphites.

*Siegel's Syrup*: Aloes, capsicum, licorice and treacle.

*Woodward's Gripe Water*: Liquor magnes. carb., ol. anethi, sugar, and a trace of alcohol.

*Pink Pills*: Sulphate of iron, an alkaline carbonate and licorice, thickly coated with sugar and colored with carmine.

*Steelman's Teething Powders*: Calomel and starch.

*Warner's Safe Cure*: Nitrate of potassium (about ten grains to the ounce) and various diuretic herbs.

*Mrs. Terry's Drink Cure*: Sugar (98 per cent.) and salt (2. per cent.)

*Antidipso*: Chlorate of potash and sugar.

#### PATENT MEDICINES AND DRUG FOODS.

Geo. G. Nasmith, M.A., Ph.D., Chemist to Provincial Board of Health.

	Alcohol by volume.	Approximate constituents.
<i>Peruna</i> .....	24.90	Vegetable extractives.
<i>Ontario Chemist's Tonic Bitters</i> .....	15.58	Vegetable bitters.
<i>Stringer's Nervine</i> .....	7.95	Sarsaparilla, oil of wintergreen, sulphates.
<i>Dr. Shoop's Restorative</i> .....	10.2	Bitters, sugar, strychnine (3-100 grains to dose.)
<i>Castoria</i> .....	3.5	
<i>Ayer's Sarsaparilla</i> .....	23.30	Sarsaparilla, potass. iodide.
<i>Burdock Blood Bitters</i> .....	16.00	Bitter, sugar, lime phosphates.
<i>Warner's Safe Cure</i> .....	11.40	Potassium nitrate, herbs.
<i>Hood's Sarsaparilla</i> .....		Sarsaparilla, potass iodide.
<i>Lydia Pinkham's Vegetable Compound</i> .....	21.00	Sugar, bitter herbs.
<i>Paine's Celery Compound</i> .....	19.00	Bitter herbs, sugar, potash salts, phosphates (small quantity.)
<i>Pierce's Golden Medical Discovery</i> .....		Wild cherry extract, iron and phosphates, arsenic.
<i>Powley's Liquozone</i> .....		Sulphurous acid, sulphuric acid, iron .08%, phosphoric acid.
<i>Chase's Catarrh Cure</i> .....		Starch, menthol, carbonates, borates.
<i>Agnew's Catarrh Cure</i> (formula on bottle confirmed.) .....		Cocaine hydrochloride, benzoates, Sod. bicarb. boric acid, menthol.

The following miscellaneous specimens have been examined for alcohol. Of these, Vin Mariana and Vino don Lorenzo, very largely used as tonic wines, are evidently of high quality. Florida Water, whose use as an alcoholic stimulant is by no means rare, is a dangerous one. A case has been recently reported of the death of six Indians from the effects of a drunken debauch in which Florida Water was the only stimulant used.

	Alcohol by volume.
Vin Mariani .....	17.35%
Vino don Lorenzo .....	16.85%
Kola Tonic Wine .....	2.10%
Florida Water .....	96.00%
Bay Rum .....	52.70%
Dr. Agnew's cure for the Heart .....	16.10%



CONSUMPTION CURES.

A beginning has been made at the analysis of consumption cures, so-called. *Psychine* contains: Alcohol, Glycerine, oil of cloves, or closely allied oil and a bitter almost certainly *Calumba*.

*Hoofland's Consumption Cure*: Glucose and Tar water or oil of White Pine.

—From the Reports of the Provincial Board of Health for Ontario

COMMONWEALTH OF MASSACHUSETTS.

STATE BOARD OF HEALTH.

Reports upon Food and Drug Inspection for the year ending September 30, 1902.

[From the Thirty-fourth Annual Report of the State Board of Health of Massachusetts for 1902.]

PROPRIETARY MEDICINES.

In the twenty-eighth annual report of the Board, for 1896, a condensed compilation was made of the results of certain examinations of proprietary medicines made in prior years by the analysts of the Board and scattered through various reports.

Frequent requests are continually made for copies of this report, and in view of the fact that it is now out of print and further copies are unavailable, it has been thought best to reprint most of the data contained therein relating to lead in cosmetics, alcohol in tonics and bitters, etc., calling attention to the fact that most of the reprinted analyses were made prior to 1897, and represent the condition of the various preparations at the time they were collected. In most cases the preparations were examined for the presence of a single ingredient only, to which it was thought best to call especial attention on account of its questionable effect upon health.

*Cosmetics.*

The following were found to contain acetate of lead (sugar of lead) or some active lead compound :—

	Per Cent. of lead contained.
Ayer's Hair Vigor contained the equivalent of about . . . . .	0.30
"Renown" Hair Restorer contained the equivalent of about . . . . .	1.86
Mrs. Allen's Hair Restorer contained the equivalent of about . . . . .	2.30
American Hair Restorative contained the equivalent of about . . . . .	0.61
Barrett's Vegetable Hair Restorative contained the equivalent of about . . . . .	0.22
Chevalier's Life for the Hair contained . . . . .	Much
Hall's Vegetable Sicilian Hair Renewer contained the equivalent of about . . . . .	1.75
Wood's Hair Restorative contained the equivalent of about . . . . .	1.59
Ring's Vegetable Ambrosia contained the equivalent of about . . . . .	1.51
Parker's Hair Balsam contained the equivalent of about . . . . .	2.32
Wolf's Vegetable Hair Restorer contained the equivalent of about . . . . .	0.95
Champlin's Liquid Pearl . . . . .	Much

Instances of lead poisoning have been known to occur from the free external use of such preparations as the foregoing.

*Quinine Pills*.—Several brand of these have been examined during the year, nearly all of which were found to contain approximately the required amount of quinine sulphate. One brand of pills manufactured by Arthur J.

Connor, of Boston, purporting to contain 2 grains each of quinine sulphate, was found to contain 1.4 grains per pill of total alkaloids. The pills also contained a notable quantity of powdered tale or soapstone (magnesium silicate).

*Cigarettes.*—The “Star Brand of Medicated Cinnamon Cigarettes,” purporting to contain no tobacco, were found to contain a large proportion of the latter in mixture with various aromatic herbs and cassia.

*Summary of Drug Statistics*

	Genuine.	Adul- terated.	Total.	Per Cent. of Adul- teration.
Acidum tannicum.....	4	10	14	71.4
Æther.....	5	1	6	16.6
Alcohol.....	6	6	12	50.0
Aqua ammoniæ fortior.....	1	3	4	75.0
Aqua destillata.....		7	7	100.0
Capsicum.....	69	10	79	12.6
Cera alba.....	3	6	9	66.6
Cera flava.....	32	40	72	55.5
Chloroformum.....	1	2	3	66.6
Extractum glycyrrhizæ.....	1	1	2	50.0
Ferri et quinine citras.....	6		6	.0
Glycerinum.....	124	19	143	13.3
Liquor calcis.....	7	6	13	46.1
Maranta.....	31		31	.0
Miscellanecus.....	29	24	53	45.3
Oleum caryophylli.....	2	2	4	50.0
Oleum limonis.....	7	17	24	70.8
Oleum olivæ.....	71	32	103	31.0
Opii pulvis.....	2	1	3	33.3
Potassii bitartras.....	3		3	.0
Pulvis glycyrrhizæ compositus.....	21	1	22	4.5
Quininæ sulphas.....	24	1	25	4.0
Sodii boras.....	8	4	12	33.3
Sodii phosphas.....	124	17	141	12.0
Sodii phosphas effervescens.....	5		5	.0
Spiritus ætheris nitrosi.....	4	36	40	90.0
Spiritus frumenti.....	1	7	8	87.5
Sulphur lotum.....	11	29	40	72.5
Sulphur præcipitatum.....		11	11	100.0
Syrupus.....	6	3	9	33.3
Tinctura iodi.....	18	183	201	91.0
Tinctura opii.....	2	8	10	80.0
Zingiber.....	8	1	9	11.1
Total.....	636	488	1,124	43.4

The following contained corrosive sublimate, or some other poisonous salt of mercury, in the proportion of 1 to 15 grains per ounce:—

Harriet Hubbard Ayer's Recamier Cream, Balm and Lotion.

Madam Ruppert's World Renowned Face Bleach.

Madam Yale's Excelsior Complexion Bleach.

Hill's Freckle Lotion.

Soule's Freckle and Moth Eradicator.

Perry's Freckle Lotion.

Oriental Cream.

Mrs. McCorrison's Famous Diamond Face Lotion (14.7 grains to the ounce).

Royal Cream.



In one instance a six-ounce bottle contained 47 grains of corrosive sublimate; another contained 14 grains of the bichloride per ounce. It is not surprising that instances of serious harm were reported from the use of such articles.

### *Tonics and Bitters.*

The following were examined for the purpose of ascertaining the percentage of alcohol in each. Some of them have been recommended as temperance drinks:—

	Per cent. of Alcohol (by Volume).
"Best" Tonic .....	7.6
Carter's Physical Extract.....	22.0
Hooker's Wigwam Tonic.....	20.7
Hop Tonic.....	7.0
Hooftland's German Tonic.....	29.3
Howe's Arabian Tonic, "not a rum drink" .....	13.2
Jackson's Golden Seal Tonic.....	19.6
Liebig Company's Cocoa Beef Tonic.....	23.2
Mensman's Peptonized Beef Tonic.....	16.5
Parker's Tonic, "purely vegetable," recommended for inebriates.....	41.6
Schenck's Sea Weed Tonic, "entirely harmless" .....	19.5
Atwood's Quinine Tonic Bitters.....	29.2
L. T. Atwood's Jaundice Bitters.....	22.3
Moses Atwood's Jaundice Bitters.....	17.1
Baxter's Mandrake Bitters.....	16.5
Boker's Stomach Bitters.....	42.6
Brown's Iron Bitters.....	19.7
Burdock Blood Bitters.....	25.2
Carter's Scotch Bitters.....	17.6
Colton's Bitters.....	27.1
Copp's White Mountain Bitters, "not an alcoholic beverage".....	6.0
Drake's Plantation Bitters.....	33.2
Flint's Quaker Bitters.....	21.4
Goodhue's Bitters.....	16.1
Greene's Nervura .....	17.2
Hartshorn's Bitters.....	22.2
Hooftland's German Bitters, "entirely vegetable and free from alcoholic stimulant".....	25.6
Hop Bitters.....	12.0
Hostetter's Stomach Bitters.....	44.3
Kaufman's Sulphur Bitters, "contains no alcohol" (as a matter of fact it contains 20.5 per cent. of alcohol and no sulphur).....	20.5
Kingsley's Iron Tonic.....	14.9
Langley's Bitters.....	18.1
Liverpool's Mexican Tonic Bitters.....	22.4
Paine's Celery Compound.....	21.0
Pierce's Indian Restorative Bitters.....	6.1
Puritana.....	22.0
Z. Porter's Stomach Bitters.....	27.9
Pulmonine.....	16.0
Rush's Bitters .....	35.0
Richardson's Concentrated Sherry Wine Bitters.....	47.5
Secor's Cinchona Bitters.....	13.1
Shonyo's Germah Bitters.....	21.5
Job Sweet's Strengthening Bitters.....	29.0
Thurston's Old Continental Bitters.....	11.4
Warner's Vinegar Bitters, "contains no spirit" .....	6.1
Warner's Safe Tonic Bitters.....	35.7
Warren's Bilious Bitters.....	21.5
Wheeler's Tonic Sherry Wine Bitters, 19.....	18.8
Wheat Bitters.....	13.6
Faith Whitcomb's Nerve Bitters.....	20.3
Dr. Williams' Vegetable Jaundice Bitters.....	18.5
Whiskol, "a non-intoxicating stimulant, whiskey without its sting" .....	28.2
Colden's Liquid Beef Tonic, "recommended for treatment of alcohol habit".....	26.5
Ayer's Sarsaparilla.....	26.2
Thayer's Compound Extract of Sarsaparilla.....	21.5

Tonics and Bitters.—*Continued.*

	Per cent. of Alcohol (by volume)
Hood's Sarsaparilla.....	18.8
Allen's Sarsaparilla.....	13.5
Dana's Sarsaparilla.....	13.3
Brown's Sarsaparilla.....	13.3
Corbett's Shaker Sarsaparilla.....	8.8
Radway's Resolvent.....	7.9

The dose recommended upon the labels of the foregoing preparations varied from a teaspoonful to a wineglassful, and the frequency also varied from one to four times a day, "increased as needed."

Supplementary to the above list as quoted from the 1896 report are given the following results, obtained more recently:—

	Per Cent. of Alcohol (by Volume)
Hoff's Extract of Malt and Iron.....	5.24
Peruna.....	28.59
Vinol, Wine of Cod Liver Oil.....	18.88
Lydia Pinkham's Vegetable Compound.....	20.61
Dr. Kilmer's Swamp Root.....	7.32
Dr. Peter's Kuriko.....	14.00

For purposes of comparison the following table, taken from "Materia Medica and Therapeutics," by J. Mitchell Bruce, is added, showing the percentage of alcohol (by weight) in various alcoholic beverages. It will be seen that there is more alcohol in many patent medicines than in wines and liquors, and it is further said that the alcohol used in the manufacture of patent medicines is of an inferior quality.

	Alcohol by Weight.
Whiskey, Rum, Gin, Liqueurs.....	51 to 59%
Port, Sherry, Madeira.....	16 to 22%
Champagne.....	10 to 13%
Hock, Burgundy, Claret.....	8 to 12%
Cider.....	5 to 9%
Ale, Porter, Malt.....	3 to 5%
Koumiss.....	1 to 3%

Here is a proof of the presence of alcohol in patent medicines

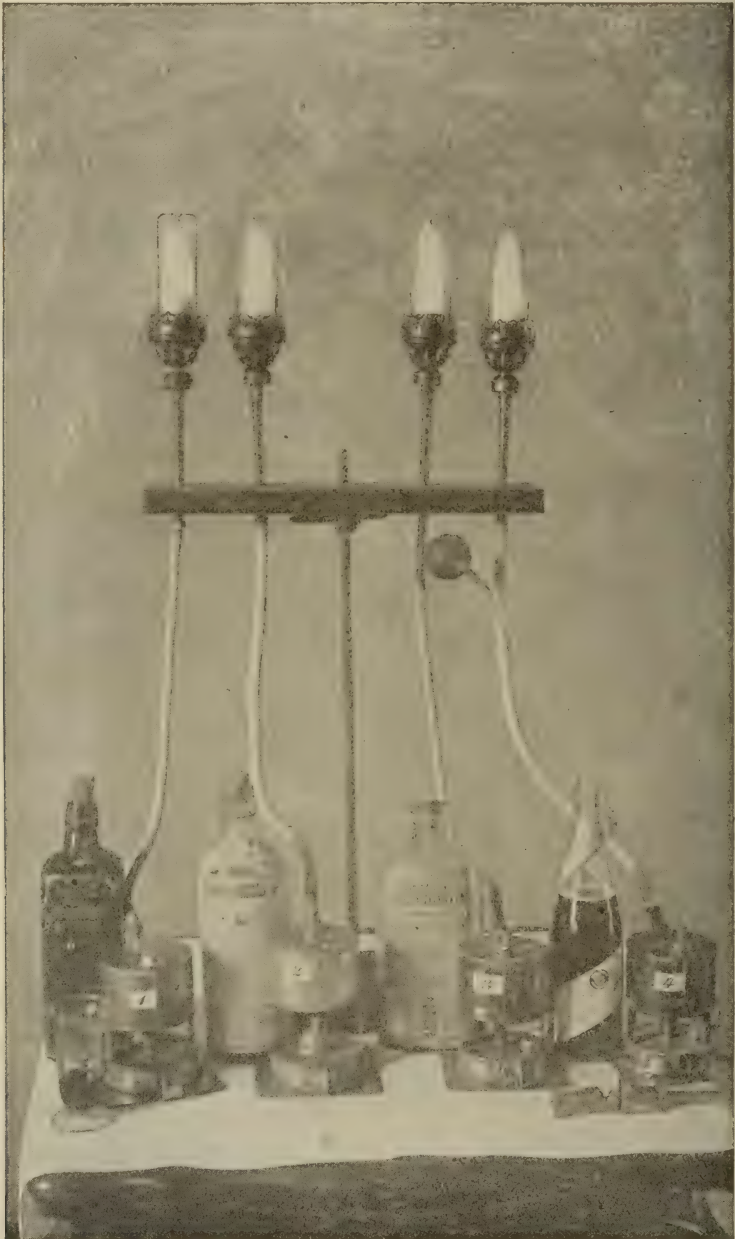
## HOW PATENT MEDICINES WILL BURN.

—From *The Ladies' Home Journal*.

Dr. A. J. Read, of the Battle Creek Sanitarium, recently made for the periodical, "The Life Boat," of Hinsdale, Illinois, an interesting experiment for the purpose of testing the alcohol in patent medicines. He reports that he put in one can 4 drachms (1 tablespoonful) of "Hostetter's Stomach Bitters"; in a second can the same amount (1 tablespoonful) of "Peruna"; and in a third can a similar amount of "Lydia Pinkham's Vegetable Compound," and in a fourth



can a tablespoonful of "Beer." The cans were connected by rubber tubes to a gas burner and mantel, heat was applied and the vapor gave bright illumination as follows :—



Can No. 1 :	Hostetter's Bitters	.....	burned for 4 minutes.		
"	2 :	Peruna	.....	"	2 " 40 seconds.
"	3 :	Lydia Pinkham's Vegetable Compound	.....	"	2 " and 35 "
"	4 :	Beer	.....	"	20 "

## ONE MORE PROOF.

## PERUNITIS (PERUNA-ITIS) OR HARTMANITIS?

George E. Malsbury, M.D.

Cincinnati, Ohio.

Assistant to the Chair of Practice, Medical College of Ohio; Medical Department, University of Cincinnati.

In September, 1904, I was called to see a woman just past the meridian of life, whom I found suffering from multiple neuritis. The nerves of the lower extremities, the upper extremities, and some of the nerves of the head were successively involved. There was no history nor evidence of exposure to cold, rheumatism, nor exhaustion to act as etiologic factors.

Finally, after ruling out other causes of the disease, it became evident that the patient must have been taking alcohol in some form, notwithstanding the fact that she was a refined lady and an earnest advocate of temperance, who would not knowingly indulge in any form of alcoholic beverage. I asked her what she had been drinking. She was shocked. She disclaimed being a tippler either in public or private. I asked her what medicine she had been taking. She stated that she had not been under the care of a physician.

Further examination into the history of the case revealed the fact that the patient had been using "Peruna" for a long time, taking the nostrum under all sorts of pretexts.

After explaining the case to the patient, she readily consented to stop the "Peruna" cocktails. As stated, first one nerve then another was attacked. Finally, after about three months' treatment with the usual remedies for multiple neuritis, the woman apparently recovered.

The case is interesting from a nosologic standpoint. When practicable, it is customary in medicine to seek an etiologic classification of diseases. Since the only apparent cause of the disease in this case was "Peruna" would it be proper to call it peruna-itis or perunitis? Or should we honor the discoverer or concocter of the nostrum and name it Hartmanitis?

—*American Medicine*, Dec. 9, 1904.

## II. DO YOU GET THE WORTH OF YOUR MONEY?

Now we come to the question, "When you buy Patent Medicines do you get your money's worth?" Liquozone for instance—50 cents and one dollar per bottle. You know what is in it from the evidence of Sir Thomas Stevenson at the Coroner's inquest in England. About 1 per cent. sulphuric and sulphurous acid and 99 per cent. water. It would probably cost one cent. per gallon. (*American Medicine*). Large profits these.

Patent medicines cost the people of the United States eighty million dollars per year, or to put it in another way—

## WHAT PATENT MEDICINES COST PEOPLE.

The enormous extent of the patent medicine business and the amount of money spent by people in the purchase of nostrums of one kind and another, will appear from the following extract from *Frank Leslie's Magazine* for March:



“Take all the cocoa and chocolate manufactured in this country in a year. Add all the blacking and bluing, the flavoring and extracts, and the axle grease. Take next a year’s product of that beet sugar industry, which was important enough to hold up a great treaty for two years in the Congress of the United States. Throw on all the glue, the refined lard, the castor oil, the perfumes and cosmetics, and the kindling wood. Finally put on top of the pile the entire output of ink and mucilage. The total value of this accumulation will still be less than that of a year’s product of what we call “patent medicines.” The census of 1900 placed the value of “patent medicines” produced in this country annually at fifty-nine million six hundred and eleven thousand three hundred and thirty-five dollars. As the average profit is about one-third, this means that the sum paid over the retail druggists’ counters, taking no account of increased consumption in the last four years, is something like eighty millions of dollars a year, about a dollar for every man, woman and child in the country.”

I am sure you all have neighbors who almost ruin themselves both in pocket and health with patent medicine as Mrs. Zucker did.

“PATENT MEDICINE HER FAD.—When Mrs. Louis Zucker, who is 45 and lives in Hoboken, appeared recently in court against her husband, whom she charged with assault and battery, the defendant, who is a tailor, set up a remarkable defense. He told the recorder that when he married the complainant, she represented that she had \$800, and it was understood he was to have whatever was left of this sum after the wedding expenses had been paid. This had not been done. His wife, he declared, read all the patent medicine advertisements and whenever she came across a new one she would say that it was just what her system required, and would buy a bottle. There were now, Zucker alleged, some 300 bottles of patent medicines at his home.”

—*American Medicine*, May 27, 1095

### THE RED CLAUSE.

But I can almost hear someone in the audience say, “How is it that I never heard anything of all this before if what you say is true?” If I were in turn to ask you how you know about other things that are going on, you would reply. “I read the newspapers.” Yes. And do you not know why you have never heard all this before? Did you never think how many hundreds and thousands of dollars are spent in newspaper advertising by all the patent medicine proprietors? And do you think they would pay newspapers to advertise them in one column and expose them in another column? Did you never hear of the famous “Red Clause” printed in red ink across the face of the patent medicine newspaper advertising contracts in the United States, as follows:—

“It is hereby agreed that should your State or the United States Government pass any law that would interfere with or restrict the sale of proprietary medicines, this contract shall become void.”

And do you know that this clause is used as a threat to compel newspapers to oppose any legislation directed against the patent medicine evil, on pain of losing all this advertising money? It would be interesting to know whether there is a “Red Clause” in Canada.

### THE NEWSPAPER MINUS PATENT MEDICINE ADVERTISEMENTS.

Here is something which shows how our newspapers are filled with patent medicine advertisements. It is a thing of shreds and tatters, is it not? You can hardly recognize it. It is all that is left of the editorial page and the page opposite

the editorial page of the ———, Saturday, March 11th, 1905, when the Patent Medicine advertisements are cut out. A few fragments of editorials, a scrap here and there of the hearings in the High Court of Justice and the Divisional Court, half of Eaton's advertisement, 3 railway advertisements, 3 steamship advertisements, 5 other small advertisements, one or two despatches—and nothing more! All the rest Patent Medicine advertising! Then look for a moment at this great array. These are the Patent Medicine advertisements cut out of that same issue of the ———, and pasted together on yards of muslin. What a combination of "scare-headlines," grotesque "cuts", traps to catch the unwary and statements which cannot be true. What do you think of them? Don't you think there are a good many of them? Canada is a healthy country! Why do Canadians need all this medicine?

### IS THIS TRUE?

Let us look more particularly at a few patent medicine advertisements. What do you think of this?

(1) "The Cartilage Method." "You can increase your height from 2 to 5 inches by this method."

Or this

(2) "Bile Beans for Biliousness." "Great discovery of an ancient Australian medicine."

This was proved in a lawsuit to be only ordinary drugs from an ordinary drug manufacturer, having no connection whatever with Australia. *British Medical Journal*, Sept. 30, 1905.

(3) "Kauffman's Sulphur Bitters." Printed on label "No alcohol." But the State Chemist of Utah found inside the bottle no sulphur and 23 per cent. of alcohol in a pint bottle,—price \$1.00.

(4) "Half the world is sick because of weak hearts. Ninety-nine out of a hundred have weak hearts. Dr. Agnew's Heart Cure will relieve heart disease in thirty minutes, will with certainty effect a lasting cure."

(5) We are all familiar with the maternal smile of Lydia E. Pinkham in the advertising columns of the newspapers, accompanied by such advertisements as these:

"Years ago Mrs. Pinkham, at Lynn, Mass., determined to step in and help her sex. Having had considerable experience in treating female ills with her Vegetable Compound, she encouraged the women of America to write her for advice in regard to their complaints, and being a woman it was easy for her ailing sisters to pour into her ears every detail of their suffering. . . . No physician in the world has had such training, or has such an amount of information at hand to assist in the treatment of all kinds of female ills. This, therefore, is the reason why Mrs. Pinkham in her laboratory at Lynn, Mass., is able to do more for the ailing women of America than the family physician. Any woman, therefore, is responsible for her own suffering, who will not take the trouble to write to Mrs. Pinkham for advice." June 27, 1905.



Write to Mrs. Pinkham ! But Mrs. Pinkham is in her grave ! After life's fitful fever she sleeps well, and nothing, not even a Patent Medicine advertisement, can wake her from that sleep. Here is her monument in Pine Grove Cemetery, Lynn, Mass.



—From *The Ladies' Home Journal*.

#### TESTIMONIALS.

Finally, and this is the question we have all asked ourselves, "What about the testimonials? How do they get them?"

Sometimes people really think patent medicines cure them and say so. These people are very much like the poor woman who had just been admitted to the wards of Bellevue Hospital, New York. The nurse, a friend of mine, put the clinical thermometer in the patient's mouth, and took her temperature. And just as soon as this was done the patient said, "O nurse, I feel so much better. That medicine did me good !"

#### HERE ARE SOME MORE MODERN METHODS.

(1) "Remarkable testimony has been obtained by the post-office department as to the ways in which testimonials are obtained by some of the big concerns engaged in this business. One large firm admitted that it had agents out

seeking persons who had formerly occupied prominent positions in the community, but had suffered financial reverses and were harassed by debts they were unable to settle. The agents would obtain possession of the unpaid accounts, and would then apply pressure to the unfortunate victims, demanding immediate payment in full. Finally, after long persecution the desperate victim would be invited or commanded to call at the office of an attorney, where he would be given to understand, that, if he would sign and swear to a testimonial a receipt in full for the claims against him would be given. This seems incredible, but the facts are now on file in the records of the post-office."

*New York Medical Journal*, August 24, 1904.

(2) "To what length daily journalism will go at the instance of the business office was shown in the great advertising campaign of Paine's Celery Compound, some years ago. The nostrum's agent called at the office of a prominent Chicago newspaper and spread before its advertising manager a full-page advertisement, with blank spaces in the centre.

'We want some good, strong testimonials to fill out with,' he said,

'You can get all of those you want, can't you?' asked the newspaper manager.

'Can you?' returned the other. 'Show me four or five strong ones from local politicians and you get the ad.'

That day reporters were assigned to secure testimonials with photographs which subsequently appeared in the full page advertisement as promised. As for the men who permitted the use of their names for this purpose, several of them afterward admitted that they had never tasted the 'Compound,' but that they were willing to sign the testimonials for the joy of appearing in print as 'Prominent citizens.'

*Collier's*, Oct. 7, 1905.

(3)

## LETTERS FOR RENT

300,000 Jas. Wm. Kidd, medical file cards, representing all kinds of diseases (will sort) 1904.  
180,000 men's matrimonial, 35,000 women's '04, 1st.  
200,000 agents and canvassers.  
50,000 Dr. Pierce order blanks, '02, '03.  
20,000 Ozomulson order blanks, '03.  
30,280 Theo. Noel, '02, '03, medical file cards.  
59,000 Agents' directory, '02, '04, '05.  
250,000 Home work, '03, '04, '05.  
27,500 Rosebud trust, firsts, '03, '04.  
19,500 Bond Jewelry payups, trust, '04, envelopes.  
52,000 10c. song orders, Star Music Co., '04, '05.  
17,500 Dr. May & Friar, ladies' regulator, '03, '04.  
6,000 Nervous debility, '03, '04, Appliance Co.  
Over 1,000,000 letters on hand, all kinds. Call or write me for samples and ads. Letters bought.

**C. A. Davis, 1634 W. Ohio Street, Chicago.**

An Advertisement Showing How the Names to, Orders Sent to Patent Medicine Concerns are Offered for Sale or to Rent to be Used by Others. Yet we are Told How "Sacredly Confidential" These Letters are Regarded and Held!

(FROM THE MAIL ORDER JOURNAL OF  
APRIL, 1905.)



(4)

## SOLICITED FOR TESTIMONIALS.

Patent Medicine Faker Ordered  
to Leave Toronto.

## BAMBOOZLED YOUNG GIRLS

**Healthy Damsels Signed Statements That  
They Had Been Cured of Serious  
Diseases.**

A new kind of faker has been working in Toronto of late, but will leave the city to-day, having been advised to do so by Inspector Stark. He is a patent medicine testimonial faker, and his method of obtaining testimonials is unique. His name is Squire White, and his home is in Fredonia, N. Y. Several weeks ago he registered at a local hotel and at once started operations. He would meet various girls on the streets and ask them if they wished to obtain a dozen first-class photographs of themselves, entirely free. If they answered in the affirmative he would take them to a local Yonge Street photographer, and the pictures would be taken. He would then tell the girls that he would give them one dollar each for all the others they brought to him. Then came the fake. In return for the photographs the girls signed a testimonial, stating that they had used a certain famous patent medicine, and found that it cured them of all their ills. They also signed a paper, agreeing to allow the proprietors of the medicine in question to publish the testimonial and also the photograph taken, when, how, and as often as they pleased, and in as many newspapers as required.

Detectives Cuddy and Black were acquainted with the facts of the case and apprehended White. He was taken to Inspector Stark's office and examined very closely. He admitted that he was employed to collect testimonials and photographs. He also stated that he had been doing the same work in St. Catharines, under the name of Williams. Several of the testimonials are now in the possession of the inspector, who gave White over night to leave town.—*Mail and Empire, May 19, 1904.*

## A PERUNA TESTIMONIAL.

## (5) CONGRESSMAN WHITE FROM NORTH CAROLINA.

Congressman George Henry White of Tarboro, N.C., writes the following letter to Dr. Hartman regarding the merits of Peruna :

" House of Representatives, Washington,  
February 4, 1899.

Peruna Medicine Co., Columbus, Ohio :

Gentlemen,—I am more than satisfied with Peruna, and find it to be an excellent remedy for the grip and catarrh. I have used it in my family, and they all join me in recommending it as an excellent remedy.

Very respectfully,  
GEORGE H. WHITE."

## A LETTER ABOUT THE TESTIMONIAL.

"Dear Sir,—I am just in receipt of your letter of the 12th inst., enclosing what purports to be a letter from me when I was in Congress from the Second District of North Carolina, with my residence in Tarboro, N.C.

I was the Congressman, evidently, to whom the Peruna people referred. But the letter is an absolute falsehood and forgery. I never saw or heard of it before, nor did any member of my family ever use the nostrum for grip or catarrh as alleged.

(Signed)

GEORGE H. WHITE."  
—*Ladies' Home Journal*, 1905

## PATENT MEDICINES AND THE LAW

Most civilized countries do not permit patent medicine frauds. Great efforts are now being made in the United States to obtain legislation to remedy the Patent Medicine evil. There is already a law passed in California compelling all sellers of proprietary medicines to label packages of such medicines with the name of any poison contained therein.

"By a recent ordinance of the United States Internal Revenue Department all druggists who sell proprietary medicines containing whiskey or other distilled spirit as their chief ingredient will have to pay the special liquor dealer's tax. The manufacturers of such medicines will have to pay the special tax imposed on rectifiers and liquor dealers. The ordinance will come into force on December 1st, 1905."

In Switzerland proprietary medicines must be approved of by a commission of medical men. Permission to sell proprietary medicines is refused if

- (1) The medicine contains any noxious drug.
- (2) The advertisement or labels, etc., contain falsehood or nonsense.
- (3) The price is exorbitant.

In France the government acquires at a fair valuation the sole right to sell such patent medicines as are approved, and requires a statement of the merit of the discovery, of the advantages which have been obtained in curing human ills and of the personal advantages which the inventor has already derived from the remedy or may hope to derive from its adoption. An agreement is then drawn up between the minister and the inventor, ratified by a higher authority, and the secret published without delay.



In Germany the use of patent nostrums is greatly discouraged by the German government, and every notice or advertisement of this class of preparations must distinctly embrace an accurate analysis of the ingredients or component parts used in such preparations.

In Russia no proprietary medicines are allowed to be manufactured or sold this country going further than any other in absolutely prohibiting the manufacture and sale of nostrums of all sorts.

With the English-speaking races it is radically different. In the Dominion of Canada the utmost latitude is allowed in the sale of such things, for they are sold in grocery stores, the proprietors of which are sometimes underselling the regular wholesale trade.

The same state of affairs exists in British Honduras, grocery stores dealing in many of the ordinary drugs that are only sold by licensed apothecaries in this country.

In Brazil the law respecting the sale of chemicals, medicines, poisons and proprietary articles is very strict, and if enforced must be of great benefit to the public and a protection to the physician, pharmacist and the druggist.

In England the Pharmacy Act compels the manufacturer to state on the label that the preparation contains morphine or other poisonous drugs, if this is the case, and to label it poison. It is also required by the English law that a proprietary medicine must be a genuine original invention, and a complete description of it must be filed at the Patent Office.

What will Ontario do about this?

---

## ADDRESS.

By HON. NELSON MONTEITH, MINISTER OF AGRICULTURE FOR ONTARIO.

It is undoubtedly a privilege that heretofore I have not enjoyed in speaking to such a representative gathering of the ladies of our country. I feel that it is an honor to have such a privilege, especially when I consider the object of your organization, namely, the betterment of the home life and the upbuilding of character in this great Province of ours. You have my very hearty sympathy in your work. We have heard reports of the large gathering of ladies at the Macdonald Institute, and of the fact that your numbers are so greatly increased this year that you have had to move to a larger hall. While most of you have heard the aims of the work discussed on previous occasions I thought I might for a few moments speak more particularly to those who have never been here before.

This great institution known as the Ontario Agricultural College, whose fame has gone abroad through the nations, far beyond the bounds of Ontario, has had allied with it recently the Macdonald Institute. The purpose of the Macdonald Institute is to train the girls of this country in the art of housekeeping, and everything that enters into that great science. Although the work so far has been somewhat experimental it has gone along most satisfactorily. Most of the work is new to us. We are receiving at our doors from time to time contingents of young women who come with an honest desire to improve and to gain knowledge of the science of housekeeping. I trust this condition of things will continue. I may say that as time goes on very much the same rules that we have been compelled to adopt at the Ontario Agricultural College will necessarily have to be adopted at the Macdonald Institute, that is that as time goes on it will more and more

become the college of the farmers' daughters of this Province. We have no desire to keep out those who come from the city, but the design of the founder, Sir William Macdonald, was that ultimately it should do for the farmers' daughters what the Ontario Agricultural College is doing for the farmers' sons at this time. This is something we must keep in mind, and should the finances of this Province permit that the institution may be further extended I know of no expenditure that would give better results.

We may talk about our great output of agricultural productions, but to my mind the greatest product of our farms and our homes are the boys and girls who go to make up those homes; and for that reason we should not consider that material gain is the only object in life. Our ideals should rise above that. I often think of the ideals that young men and young women should have in aspiring to positions in such work as Farmers' and Women's Institutes. An increased and widened sphere of life and work means increased power to do good. That is our most legitimate excuse for desiring to better our position in life. This should be the desire of those who hold office. The work of the institutes in this country are doing much to get us "outside ourselves" as it were, and get us in touch with our neighbors, so that the world is not confined within the four walls of our home.

We have a proud position to-day and we desire to maintain it, and it must largely rest with those who have been entrusted with the control and guidance of our homes, and you are those upon whom great responsibility has been cast. I know that your ambitions are along proper lines and I hope they may ever continue so.

I did not come out here to weary you with any lengthy address, although the subject is worthy of extended remarks, but I came to wish you godspeed in your work and efforts and to assure you that you will have in the Department one who is not deaf to your requests for money to promote the great cause you have in hand. I can say this advisedly, for I know that you are doing work which cannot be called in question. I am glad to see you entering so heartily into the matter of improving the laws in regard to the sale of patent medicine. You will now be able to sympathize with a body of men who have so many opinions in direct contradiction to each other to deal with when making up the slate. I trust that you may receive every support and encouragement in your work, and I may say that so far as the Department is concerned the Farmers' and Women's Institutes will be well looked after.



## ADDRESS.

By DR. JAMES W. ROBERTSON, ST. ANNE DE BELLEVUE, QUE.

After listening to this excellent address by Dr. MacMurchy, I shall relate an incident which came to my notice lately. I was in a town where the local option law was in force. I had occasion to go into a drug store. A moment later, in came a child hardly tall enough to see over the counter. He made a peculiar sound—"Roo-Nha"—that neither the druggist nor I could understand. After several attempts to get at his meaning, the druggist made out that he wanted "Peruna". He then brought from the cellar a whole armful to be ready for future purchasers, and handed a bottle to this poor, ill-fed, ill-clad child. The druggist had evidently plenty of sale for patent medicines containing a large percentage of alcohol. There is a whole volume of degradation in this incident. It represents something that should be stopped in this country of ours.

I may say that I have frequently taken occasion, or I have made opportunity when that did not exist, to denounce the bad habit our people have acquired of reading patent medicine advertisements, and afterwards swallowing the things they read about. The newspapers have been very gracious to me in reporting what I have said about agriculture and education, and sometimes even about frivolous matters; but only once have I been reported when speaking my mind freely on the menace to the health, to the security of life, and even to the permanence of the civilization of the people, through the habit of swallowing patent medicines. I believe a campaign started and persistently carried on by women would do great good.

I am to say a little this morning on a subject which is dear to you and very close to my heart,—the movement for the improvement of rural schools in Canada.

The Women's Institutes are doing much which makes for the betterment of life in rural parts. After all, life in the country should be life at its best. Should it not? Life at its best in every sense! Persons who can afford to choose their place of abode, live in the country a large portion of every year by preference. It is the best place to bring up children in regard to their bodies and health; and it should be the best place in regard to their education. Many people now leave the country and go to town for the sake of educating their families. I hope that in future we shall have such schools in the country that people will go to the country for the sake of educating their families. I know of two places where such a condition of things exists.

## THE MACDONALD MOVEMENT.

In your Women's Institute work you are doing much for the betterment of conditions in rural life: you are doing much to make clear to people how they can get the most out of life,—not by accumulating the most to leave behind, but by giving the best service to the community. The Macdonald Movement, as it has been called, is along the lines you are pursuing and I would like to enlist your sympathy. The Macdonald movement, as helped on by Sir William C. Macdonald, has nothing destructive in it. It does not desire to destroy anything good that now exists in rural districts, but it hopes to construct something better and thereby displace what is poorer. It aims at helping the rural population to understand better what education is and what it may do for them and their children. Many farmers say, "Education is worth nothing to me, it makes my boy idle and careless

towards farm tasks; he wants to go away from home; it makes him less useful to me as a farmer." And women have said the same thing to me about the education of their daughters. They say that education makes them clever or smart but not useful as daughters in their homes. The school should make the son or daughter helpful in the home as well as capable outside.

### WHAT EDUCATION MAY MEAN.

Just a word as to what education may mean. Education is not something that can be bought and sold,—transferred like so many pounds of groceries. It is not something that is comprised in a diploma; it is not acquired only in a school or college. It is a series of experiences leading up to the possession of certain powers. It is a series of experiences leading first of all from helplessness of body into ability of body. Therefore education should include forms of bodily training, that the body may be a fit dwelling place for a sound, well-balanced mind. The baby begins life helpless; and every experience that leads out of that state into one of personal ability is educational. The baby begins life ignorant; and everything that tends to lift one out of a state of ignorance into one of intelligence is educational. Intelligence regarding the common things of life should receive attention first. And I am glad to say our school courses are taking more of that quality into them. The baby begins life utterly selfish. One is not finding fault with the child when stating those facts. We have the child, helpless, ignorant and selfish,—with the three marks of the uneducated. We hope for some measure of escape from these; and in so far as worthy progress is made, the child grows out of helplessness into ability; out of ignorance into intelligence; out of selfishness into thoughtfulness and consideration for others. These are three steps which should characterize every school's efforts and every school's success.

Education should train the child for his own sake to be a happy individual. The child is not happy when he is given always tasks which he does not like. He may thus learn to dislike the school. But the children who have a school garden, domestic science and manual training with their books, go to school happy. It is a great thing to get into the habit of being happy. It is a great thing to make the school a place for the formation of such habits. But the school should do more than to train the child to habits whereby he may keep himself happy. It should train him to be useful to the community. "No man liveth unto himself." The lines of teaching should not make him an unsocial individual, striving only for himself. The school should do much towards training the child to be useful to others.

Further, the child is to be regarded not only as an individual and a coming citizen but also as one in the eternal procession of the human race out of the depths of animalism and the degradations of ignorance and selfishness into the best that men and women can be. "Every man that hath this hope in him purifieth himself." No man can be fully what he would like to be at his best moments of aspiration; but he may help some boy to come nearer to that. If one watches his chance he may help others to do and be what he could not attain to himself.

The rural school should be brought into touch with rural life. The school should not be a place apart from the home. It should not be a place for books only; but also for training by means of tangible things and events close at hand. But that sort of training costs more; and it is worth much more to the individual and to the community.



## A GOOD INVESTMENT.

If our rural schools are to be supplied with really capable teachers we must hereafter have higher-paid teachers. We can no longer get well trained teachers to teach in rural schools at the salaries they have been receiving. Salaries are to go up; and a teacher with adequate scholarships, training and experience must be paid a better salary. It would pay Ontario to give more attention to education in the rural districts. The progress of the Province in wealth and material prosperity depends largely on its agriculture; and in the future that must be affected greatly by the sort of education in the elementary rural schools. The little kingdom of Denmark sends to England some of the same sorts of products as Ontario. And Denmark received in 1903, \$8,400,000 more than other competing countries received in the same markets for an equal quantity of the three products—butter, bacon and eggs. That was the premium obtained by the Danes for superiority of quality and condition. Denmark has had for thirty years the kind of schools I advocate. The rural population has been educated towards ability, intelligence in regard to rural life, and the unselfishness that makes for successful co-operation. That little kingdom receives from England an immensely larger amount for her farm products than any other country for equal quantities. That is one of the premiums received annually and chiefly as one of the results of the excellence and suitability of the education in rural schools in Denmark. Ontario with a population 11 per cent. less than Denmark is reported as paying some \$3,300,000 annually for the maintenance of rural schools. To put it another way, the premium received by the Danes for superior quality and condition of butter, bacon and eggs exported, is two and a half times greater than the whole amount expended in Ontario for the maintenance of rural schools. There are material gains, and much besides from wise expenditures for schools.

Would you like to advocate increased taxation for Ontario at the risk of upholding an unpopular cause? When a man seeks public office too often he endeavours to get in by advocating lower taxation. What is taxation,—taxation under our institutions of government of the people, by the people, for the people. Everybody chipping in to do for each and for all what could not be done so well or could not be done at all by individual action alone. We cannot have better schools without better teachers; we cannot have better teachers in rural schools without better salaries; and we cannot have better salaries unless the people tax themselves. There is high public spirit in paying taxes for schools. "Bear ye one another's burdens, and so fulfil the law of Christ," and (may I add?) of Christain civilization. If we refuse to uphold taxation, to the extent of the community's needs and of our ability to pay, we are getting away from the first principles of Christianity. Taxes for schools must go up or we, as a people, must go down. We want our citizens to cherish intelligence, liberty, justice and goodwill; and these are to be inculcated in the school house. Therefore, become advocates—unpopular though it may be—of increased taxation for better schools. Money wisely spent on schools is well invested,—invested "where neither moth nor rust doth corrupt, and where thieves do not break through nor steal."

## SOME ADVANCES MADE.

I should not encroach on your time at this session to speak in great detail of the Macdonald Movement or the new Macdonald College being founded at St. Anne de Bellevue, Que. You have heard of the manual training centres provided by Sir William Macdonald. He furnished funds

to establish manual training classes in connection with the public schools in 21 places and to maintain them without cost to the public or pupils for a period of three years. The local school authorities then took over and extended the work. Over 20,000 girls and boys in Canadian schools now receive the benefits of manual training in their regular school course as one result of his benefaction.

Then there are the five groups of school gardens, with five rural schools in each group, with a competent travelling instructor, guiding the pupils and teachers in nature study and the elements of natural sciences. Besides these there are the four Macdonald Consolidated rural schools which are all giving a fine education—adapted to rural life. You have seen for yourselves the one adjacent to the Macdonald Institute. To those who have examined it, and the opportunities it affords the pupils, no words of mine are needed in its praise. You know of the Macdonald Institute in whose hall your convention was held last year. We are all, alike, proud of its staff of professors and teachers, and of the opportunities it offers to farmers' daughters and others in domestic science and to teachers of rural schools in nature study. Then, lastly, perhaps not lastly but more recently—there is the Macdonald College at which we shall be delighted to welcome students from Eastern Ontario as well as Quebec and the Maritime Provinces.

#### THE MACDONALD COLLEGE.

The site selected is a beautiful one overlooking the Ottawa River, at St. Anne de Bellevue, Que. The main lines of the Grand Trunk and the Canadian Pacific Railways pass through the property, and the stations of both railways are situated within its boundaries. What has been quite famous as the Robert Reford Ayrshire Stock Farm is part of the property acquired by Sir William. Five adjoining properties of smaller size were purchased to complete the block of land suitable for the purposes intended.

The institution which will be known as the Macdonald College will comprise several departments. In connection with the college of Agriculture proper, there will be three main departments,—the department of farms, the department of research, and the department of instruction.

#### DEPARTMENT OF FARMS.

The department of farms will consist, primarily, of the demonstration or illustration farms, each fully equipped and self contained. They will be managed for training the students, for profit and also for illustrating the best known systems of agriculture. There will be a dairy and live stock farm, with several breeds of dairy and of beefing cattle; and a small cultures farm, devoted to such products as vegetables, small fruits, large fruits, poultry, etc. Each farm will have a specialty, and it will also include stock and equipment for other branches of farming. Provision will be made on these farms for receiving a number of apprentices, who will learn the operations of farming as well as methods of management. An industrious lad will be able to earn as much on one of the farms as an apprentice as will pay for his board in the college residence building when taking a course of instruction during the winter. The same will apply to women, who may become apprentices on the small cultures farm, in connection with fruit growing, floriculture, dairying or poultry keeping. In the college department during the winter months such women could take courses in household science, including cooking, dressmaking and cutting, housekeeping and the like.



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DEPARTMENT OF RESEARCH.

The department of research will be equipped with a competent staff and commodious and suitable laboratories. One laboratory building will contain the departments of biology, bacteriology and entomology. Another will contain the departments of physics and agricultural chemistry. In this department, while the research work will be very helpful to the advanced instruction carried on in the College, original investigations will be undertaken and carried on for the benefit of agriculture in the Dominion at large.

The question of the relation of the bacterial contents of soil to its fertility is one which is very alluring, and pregnant with great possibilities of service and benefit to the farming population. In every field problems await solution, and it is expected that the staff in the research department at St. Anne's will do its full share towards advancing the knowledge upon some of them, to the profit and enlightenment of the farmer. After the department of research has advanced any discovery far enough to make it applicable to ordinary agriculture, its practicability in regard to profit making, etc., will be tested in the department of farms before any new method is commended to the farmers.

## DEPARTMENT OF INSTRUCTION.

In the department of instruction provision will be made for short courses for farmers and farmers' sons, in such subjects as live stock, improvements of seeds, improvement of soil, fruit culture, dairying, poultry keeping, farm machinery, etc. There will also be a women's department, and short courses will be offered to farmers' daughters in sewing, cooking, dressmaking and cutting, millinery, housekeeping and so on. There will also be short courses for women in dairying, poultry keeping, bee-keeping and fruit culture. The courses for men and women will be very much on the lines followed at the best colleges of agriculture.

In planning for and carrying out the assistance which Sir William C. Macdonald has been giving towards the improvement of rural schools in the five provinces of Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island, he has thought it expedient to provide a college suitable for the purpose of training men and women to be thoroughly qualified as teachers in elementary and advanced rural schools. Such teachers will be competent not only in ordinary subjects as accepted hitherto but will be qualified to use these newer means of education known as Nature Study work, Household Science and Manual Training. Those attending the teachers' department of the college will not be required to take any work in the department of agriculture, but they will have the opportunity of doing so, if they desire to familiarize themselves with any part or detail of it. A staff fully competent to carry on the work of the teachers' college will be provided.

In addition to the long course of training which may be required when the teachers' college comes to its proper work, short courses will be provided for teachers already in the service, who may desire to avail themselves of the opportunities and privileges which will be found for Canadian teachers at the Macdonald College.

## RESIDENCE FOR STUDENTS.

In addition to the instruction buildings and laboratories, there will be a residence for men and another for women.

All these buildings will be of fire proof construction. Sir William Macdonald's direction in the matter is that the buildings are to be the best of their kind for the purpose for which they are intended, due regard being had to economy for original cost and maintenance. They will make a handsome group of buildings, standing on a fifty acre field sloping towards the river, with a fine southern and eastern exposure. It is expected that the buildings will have the roofs on before the winter of 1906-07, and, barring unforeseen accidents or causes for delay, the college will be ready to receive students in the autumn of 1907.

#### WHAT IS WORTH WHILE.

I am glad to have had this opportunity to tell you about increased taxation. In this movement, as in others, when people speak favorably about it, it spreads. We are all banded together. We must not say, "There are certain things I am going to have, because I am entitled to them," but rather, "I have certain obligations and duties to discharge and I must see that I do not fail in them."

I think of the time when one is old and says, "I am tired; I have had my fill; I have been at the feast; I have drunk deeply of every lawful cup; I am willing to sit back; I should be glad of quiet and to enter upon the long rest." When a man is full of years he may pass in review the days gone by. Perhaps he may estimate values and think what was worth while. I remember to this day the fragrance of that rose I got as a boy. I smell it still sometimes when I lie awake at night. And I remember the first time I ate sponge cake; how good it tasted! How pleasant were the awakenings, the full awakenings, of even the senses! I remember still some fine colors that shot into my consciousness and left me throbbing. I mind particularly one Sunday evening in summer when as a bare-footed lad I lay in a furrow of a pasture field, day-dreaming before the gloaming as the sun went down behind the clouds. The words my mother had been reading to me a few hours before were still in my ears. The colors of the glorious sunset pushed them on into my soul. "Lift up your heads, O ye gates; even lift them up, ye everlasting doors, and the king of Glory shall come in."

Do you remember the first anthem, the first great choir? Besides there are the dozens of intellectual awakenings which come gradually and gently to the full morn and noon and evening of life. These all help to make life worth while; and furnish part of the satisfying memories which one would like to have in the great review.

Do you suppose that one would dwell with fond memory on the fact that once he bought a certain piece of property for a few hundred dollars and that it advanced in value to thousands and made him rich? Would he have fine contentment in thinking how his business keenness outdid the other fellow; of how he downed him in fierce competition and came out ahead? Don't you think there would be serene gladness in recalling the times and ways in which he had helped others, the once or oftener he had helped boys or girls to get better schooling than would otherwise have been their privilege? The things that count are those whereby we have done our part in helping others to be useful and happy. What shall it profit a man if he gain the whole world and lose his own chance of helping the boys and girls?

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## ORGANIZATION OF BRANCHES.

BY MISS L. McMILLAN, HILLSBURG.

In organizing a branch institute, the first essential is to have the people thoroughly understand the work of the institutes, and the benefits to be derived from these organizations. In some communities it will be found that a very great prejudice exists towards the institute, which usually arises through a misunderstanding of what the work really is.

When contemplating the organization of branches in different parts of the riding, it would be well to send one of the district officers to all the points to talk up institute work and learn the feeling of the people regarding it. When all the women want an institute it is a very easy matter to form a branch, but, on the other hand, when some of the ladies favor it and some object, it is anything but easy.

Make suitable arrangements for the holding of meetings; secure the best institute speaker available; advertise the meetings well, by having attractive programmes printed, and send these out from one week to ten days previous to the meeting. If they are out longer there is generally a danger of something else turning up in the meantime, and then the institute meeting is forgotten.

One of the best ways to interest the ladies is for the speaker to give them an outline of institute work, and the benefit it would be; then give a talk suitable to them and their surroundings; or possibly a cooking demonstration on something within the reach of all, not using ingredients that cannot be procured in the country and were probably never heard of; finally talk on organizing a branch. If the ladies present do not feel like organizing a branch it is better not to try and force the matter, but leave with them a good impression of the work, and plan for a meeting in the same place in from three to six months.

When a branch is being organized the first thing to do is to explain the different offices, the work of each officer, and the kind of person suitable for the different offices. For the president, choose the best woman in the community; one who has a practical knowledge of housework, a genial disposition, and is popular with the people, not for her social abilities, but for her good qualities.

For vice-president, have the woman who will make a good support and assistant; and for the secretary (who is also "managing director"), the right person would be one of the younger members, who will take an active interest in the work, has some knowledge of book keeping, is prompt in answering correspondence, and has considerable business ability.

In our district we have found it well to appoint three directors for each branch, to assist with the general work and secure new members. Two auditors should also be appointed, whose duty it shall be to audit the books at the end of the year.

In appointing these officers it is advisable to vote by ballot, as this method brings out the feeling of the people much better than any other way.

In the location of branches, consider the country. If the farms are small and the population large, branches may carry on successful work within a few miles of each other, say from five to six miles. On the other hand, if the farms are large, guard against having the branches too close to each other, as the membership would not be sufficiently large to permit the branches to flourish.

Suitable places to organize would be in the villages, and at points where Farmers' Institutes hold their meetings.

In each district six or eight branches could be successfully managed by the district officers, but, unless the secretary is in a position to devote a great deal of time to the work, more than this number is hardly advisable, as some of them would be neglected, and to neglect a branch means slow but sure death to it. With a good president and secretary, and a little encouragement from the district officers, a branch will be almost sure to prosper and do good work in any locality, even though it is not receiving all the support it should.

## THE BEST WAY TO INCREASE MEMBERSHIP.

BY MRS. (DR.) ROBERTSON, MILTON.

Our superintendent has suggested that in talking up this phase of the work I might tell you of the methods adopted in Halton district. What I may say will be from the standpoint of a *district* officer.

No doubt Halton, with its very large membership, is looked upon by many as having some "royal road" to success, but I can assure you that is not the case. We have had no particular good fortune. We have made our own fortune in our own way, and we owe what measure of success we have attained to the good work of the officers and directors of the district and the local institutes, with the assistance always of our ever ready superintendents. Mr. Creelman in our earlier days, and now Mr. Putnam, have been exceedingly good to us, and we owe very much to the help thus obtained.

We began in a small way. Some of us, at the solicitation of Miss Maddock in 1901, consented to become officers, even before we had any members. We soon held a small meeting, and enrolled ten members. These members then elected permanent officers and the work began. The first year we had only thirty members, and felt very much discouraged, but made up our minds to keep at it.

During our second year we found great benefit from attending the meetings of the Farmers' Institute. We must give the officers of the Halton Farmers' Institute great praise for their help,—especially the secretary who was ever ready to assist us. We were always able to have the lady delegate to assist us at an afternoon meeting for ladies only, whilst we attended the evening meetings together. At these afternoon meetings we always obtained many new members, and usually were able to form a branch institute in any central locality.

We kept this work up until the summer meetings seemed to suit our work better. These we were particular to advertise well, and found them of great help.

Ours is a mixed community, there being many towns and villages scattered all over our county. We make it a point to start our branches in a town or village, doing our best to get the membership from the surrounding country, as well as from the local place. In this we succeeded, and to this fact we must attribute much of our success. We divided our county up as well as possible, so that the whole ground would be covered. The county officers visited the branches as often as possible, encouraging and strengthening them.

Then we owe much of our success to the aid of the speakers and demonstrators sent to us from the Department of Agriculture, especially when we had a series of meetings.



We hold monthly meetings, frequently in private homes, where we can have influence in getting the ladies to attend. We advertise all our meetings judiciously and well, and always study how to make our meetings most interesting, getting the local members to take part as much as possible, and occasionally getting outside help. As Halton was the banner county of the Province in membership, we encouraged our branches to each try to be the banner branch. This soon caused friendly rivalry, and then members were added rapidly.

Then we did not overlook the social side of the meetings; we cultivated a spirit of friendliness, and always tried to have a few minutes for social intercourse. We found having refreshments occasionally very helpful.

We made the annual meeting as representative as possible, doing our best to have some present from each branch, and leaving the business as free as possible to all. We use every means in our power to interest the ladies, knowing that they will then attend the meetings and become members.

Our officers from the beginning have had *heart* in the work, and this is as important as ability. Of course we want officers with ability, but we think ability is a secondary consideration. We must have officers, too, that are popular and well known, and they should be those who are of one mind and can work together. The faculty of getting others to work is an important one, and officers who can best accomplish this will succeed, other things being equal. We have been blest always with a thoroughly capable secretary, who has been prompt with all correspondence, and has kept herself in touch with the members throughout the county.

Now I have only given you some of the means we found suitable and most effective in building up our Institute in Halton. While we succeeded fairly well, as is shown by our membership, there may be other means better adapted to other localities.

As I said in the beginning we began with a membership the first year of thirty. I am proud to tell you that up to date for 1905 Halton has a membership of 594.

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## THE BEST WAY TO INCREASE MEMBERSHIP.

By MISS SUSIE CAMPBELL, BRAMPTON.

Had I been asked to increase membership instead of tell how to do it, I would have preferred the work to the talk. I have been in office only six months, and am not familiar with Institute work. Some of the ladies called on me and asked me to take the secretaryship. I knew nothing of Institute work. However, I went to the meeting and later on marched home with the laurels of District Secretary, and also Branch Secretary (Brampton).

My desire is to fulfil my trust, and my object in coming to the convention is that I may become educated in all rules bearing upon Institute work, and to listen to the excellent addresses. However, I shall give you a brief account of the work done in Peel County since June.

The county president and myself went to Bolton and met other speakers. We were told it would be impossible to organize a branch, as the people were not in sympathy with the work. A number of intelligent ladies were in the hall, and I could not see why, if an interest were aroused, a branch could not be formed, as there was plenty of latent talent ready to be cultivated. We succeeded in organizing at that June meeting, and from the reports received I am sure the foundation for successful work is being laid.

We went to Caledon East, but found the atmosphere was not so congenial. More will power is required to have good results, but it is worth striving for.

At Cheltenham we were entertained by the ex-president for the district. The day was perfect, and I think Peel might well be proud of her good-looking, intelligent ladies on the lawn of Mrs. Wilkinson. The prospects were that no branch could be formed that day. The lady speakers wanted to know what they were to talk about. I thought, "Now is the time to talk organization;" and we now have at that place a branch and also a delegate to this convention.

In November we went to Streetsville. We had often been told we might as well try to pull harrow teeth as try to get a hearing. Thirty-five ladies attended the meeting, and at once I discerned that they were of a superior class. The District President gave a paper on "The Use of Sugar as Food" and also good recipes for Christmas candy, it being appropriate to the season. I gave a talk on "Christmas Giving" and also a demonstration of about thirty inexpensive Christmas presents with patterns or designs. Unusual interest was manifested, and at this time I said, "How nice it would be to have a branch in Streetsville." We did not require a dentist at this meeting after all. We felt we were almost invited to form a branch. In twenty minutes we had the officers elected.

If I were to give a rule for increasing Institute membership it would be something like this equation:

Interest in others + knowledge of work + love of work + unity + combined efforts, will equal without fail an increase of membership.

Fifty members have been added to Brampton Branch alone since June, and over seventy throughout the county. Brampton is the banner branch.

The officers should be able to explain the use of the Institute, and also to impress upon people that they will derive lasting good by being connected with it. Much happiness and sociability will be dispensed, and a practical education will be given to all women.

Writing of minutes and commenting on programmes, interspersed with humor, has a good effect. Have something under cover for emergency cases. Send bright, stirring locals to newspapers, and have the reporters waiting with a blank space to insert the report of last meeting. Reporters are the most pleasing and affable persons on the street if you only give them a local. No "respector of person" are they. You may be Whig or Tory.

Many have the erroneous idea that the Institute is for cooking only. If stomachs are the only organs to be ministered to, I pity mankind. The eye, the ear, the hand, the intellect, all need cultivating and require apt teachers. God displayed variety, system, order in all his work. May we take from this the lesson to have a miscellaneous programme at our meeting? Variety to suit the most fastidious, and something adapted to all women so that all may take part.

Do not choose Mrs. Somebody for president because she has a little wealth or because her husband is a lawyer, M.P., or doctor, but have a farmer's wife, if she possess good common sense and be a practical woman. The farmer's wife may be able to teach the doctor's wife, and the mechanic's wife's address may benefit the society woman.

Institute work is in its infancy. How it will grow will depend on the foundation laid. Our Institutes are for the education of women, and the diffusing of ideas among all women, relating to home-making. We want a little nonsense with a great deal of sense in our meetings. We like to hear from cooks, needlewomen, nurses, home artists, M.D.'s., B.A.'s. and K.C.'s..



also dear mothers and daughters, and we will then have a varied, instructive, beneficial, and humorous programme, enough to change the features of a long-faced Presbyterian!

Let us aim at not canvassing for members. We should make our meetings of such a high standard, that ladies will request us to have their names enrolled. I meet the ladies on the street, in their homes, and receive many members in this way.

In this noble Canada of ours, where the most influential men are bending their energies to nation-building and the general prosperity of this fair Dominion, is not this the time for Institute women to bend their energies to character building? The foundation is laid in the home, and the Institute is for making efficient women in the home. The hope of the country is the home; and the most important factor in the home is the woman who stands at the head of it. She should be an "efficient" woman. If we could convince women that the Women's Institutes are destined to accomplish a greater work for the home than has yet been seen, we would increase our membership more quickly. The day is coming when every woman will be proud that her name is enrolled, and others will be sorry for lost opportunities.

## METHODS TO SECURE THE ACTIVE ASSISTANCE OF ALL MEMBERS.

By MRS. M. E. GRAHAM, AILSA CRAIG.

To secure the active assistance of all members is perhaps the most difficult problem to solve in connection with our work. There are of course many reasons why this is so. Many women are content to attend the meetings, to listen, to see, and to absorb. But while they absorb much they are slow to impart. Some, unfortunately, though perhaps not wholly understanding the question under discussion, are too shy, modest, or retiring in their disposition to even ask a question. Consequently they often carry from the meetings ideas contrary to those advanced.

One member says: "No one should attend a meeting without saying something, either asking a question or expressing an opinion." This might be possible in a small meeting, for it is in the semi-social meeting with few present that many members will more freely express their views. But while it is not necessary for each member to say something at every meeting, all members should deem it a privilege to assist in some meeting. It is the one who prepares the paper or address who gains the most knowledge on the subject. Her study must be wide in order to impart.

In our Institute we meet this difficulty. Of an average attendance of from twenty-five to thirty-five members, there may be only ten or a dozen of these at each meeting. The remaining twenty to thirty may not come to the next nor have been at the last. It usually falls, then, to the ten or a dozen regular attendants to supply the programme and take part in the discussion. In such cases the president might call on those irregular attendants for expressions of opinion, as the quiet woman may have the most brilliant ideas, and requires only a little pressure to impart them. Some members have been known to give splendid papers or addresses when they have been appointed for that purpose. There are others who would simply stay at home if they knew they would be asked to speak. For this reason we have not been able to take the members in alphabetical order when arranging for members to take part in the programme. When we find that

some member is particularly successful in a line of work, the president or a member of the programme committee sends a friendly little note or makes a call, asking for a paper or demonstration on their special subject. In this way we have received some splendid assistance.

We find that having our programme arranged for the year and printed, each member having a copy, is a helpful plan, as there is then no excuse for the topics being left without some consideration. This permits of topics being brought up in conversation months in advance. We often sub-divide the topics, giving sub-divisions to as many members as possible. These are announced in the local papers.

In preparing a paper personally, I frequently advance extreme ideas, which are sure to call out discussion. Nevertheless we still have many members who will not render any assistance.

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## METHODS TO SECURE THE ACTIVE ASSISTANCE OF MEMBERS.

By MRS. F. E. WEBSTER, CREEMORE.

If Mr. Putnam had asked us to tell of the methods that have failed to secure the active assistance of all members, it would have required more than seven minutes to do it. The successful methods are not so numerous.

In our experience the best success has been in following Mr. Putnam's advice regarding the "Roll Call," when each member is expected to contribute something to the programme as her name is called. Of course this is often met with the answer "I am not prepared." To overcome this the president should endeavor to cultivate the acquaintance of all the members, learn their special tastes, and what they are doing, so that by judicious questioning good points may be drawn from the unprepared member. Perhaps one member of her family has been ill. Ask what she has found to be the most successful treatment of the disease. If she has taken prizes at the fall fair, ask her by what methods she attained her excellence. If she is even moderately successful in any department of her work, question her about it. If any member is musical and an instrument is available, by all means let her make her contribution in that way.

I would say that the president who is an expert in asking questions is the most important factor in drawing out the silent members. I would like to give a word of caution here from my own experience. Do not press the questions too far unless you are sure of the ability of your audience to answer. I blundered once by assuming that the members present had read at least a few books of which they would have some sort of an opinion, and I tried to coax or force a discussion on books, which resulted in confessions of ignorance by some and angry silence by others.

A very practical meeting was held by one of our branches during the fruit season. One of the members opened her kitchen; the fruit was preserved, and each stage of the process discussed by all present. The same idea might be profitably carried out in a good dairy, or at the home of the woman who is making a success of chicken raising by artificial incubation.

I might mention one way in which I secured the help of some of the members. I went to their homes and dictated papers which they read and took the credit of writing quite willingly. Others I supplied with literature from which they took notes. I have found that those who are assisted in this way will require less coaxing and take greater interest in the work after-



wards. Of course we all understand why every member should take part in the meeting. Those who have taken part in this convention will go home better pleased and with a more exalted opinion of its success than those who have merely listened.

In an average Institute gathering a good programme is not likely to be forthcoming unless the officers are willing to give much time and energy to persuading and warming up the enthusiasm of the luke-warm majority.

Sometimes our members complain that domestic topics have been worn threadbare. An easy way out of this difficulty is offered in a perusal of the report of the National Council of Women. I wish to call special attention to this, because, although these reports have been sent to each Institute, I do not doubt that there are many who, like myself, lay them by, hoping to read them in the slack time,—which never comes. I, for one, would not have known how valuable the last report is if my husband had not read to me while I worked.

### CO-OPERATION OF TOWN AND COUNTRY LADIES IN INSTITUTE WORK.

BY MRS. (DR.) KITCHEN, ST. GEORGE.

My subject is a very important one, for on the co-operation of town and country ladies depends the success of the majority of our Institutes, if all the women in each of the districts are to be interested. To me the question presents few unusual difficulties.

In those parts of Western Ontario with which I am most familiar, there is little room for the sort of class prejudice, or discriminating caste lines that my subject seems to indicate. We find numbers of farm houses supplied with many things which we were wont a few years ago, to consider among the luxuries of modern city life,—hot air heating, hot and cold water in bath-room and kitchen; up-to-date utensils in the work rooms; the young people having the benefits of college training and education, bringing back to their homes the broadened desires and outlook of the wider environment; reading circles where a variety of magazines are passed from house to house, bringing all classes more closely in touch. But, apparently, this is not the condition in all sections, and the question is "How can we promote unity of interest in Institute work?"

First, organize and get the women to attend. If the usual methods, aided by the excellent suggestions given at this convention, and assisted by a popular demonstration on lines of local interest by one of the Government delegates, are not sufficient to secure their attendance, I would send out written invitations. Failing in these, try a personal visit by ladies who thoroughly understand the work designed to be carried on by Women's Institutes and the benefits to be gained therefrom. If they are ladies who thoroughly believe in its efficiency, they will be able to explain matters clearly.

The work must be drawn on broad lines. The idea that Domestic Science means only the preparing of foods—important as this is to the health and happiness of our families—must be dispelled, as must also the erroneous impression that because Women's Institutes are in some way allied with Farmers' Institutes, they must of necessity concern only farmers' wives.

Institute work must be taken up on the broad basis that it will benefit every part of the home life of every style of home; benefit all the inmates, old as well as young, touch all phases of life and all kinds of work. If there

is a woman whose love of home and family, whose pride in her district, and desire that it may be as advanced as others, pride in our fair Province of Ontario, is not sufficient to ensure her attendance, where benefits to all these may be secured, I do not know that it is worth while to take further trouble to gain her assistance.

An important factor in success is a wise choice of officers. They should be women who feel that this is one of the best means the century offers for the benefitting of our homes and our position as women; for the strengthening and building up of character, making life pleasanter, nobler, widening our outlook, and promoting the health and happiness of all classes. They should be women who hold that a women's education is incomplete and sadly lacking if she is not versed in all things that tend to make her a capable housekeeper and homemaker. They must be women of tact, intelligence, energy, enthusiasm, and common sense. I differ from the opinions that lay particular stress upon the paramount importance of the secretary's office. While in no way belittling the importance of that office—for a good and efficient secretary is invaluable—I think the success of the Institute depends very largely on the president, and on her possessing the qualifications I have mentioned, as well as many others.

After the attendance has been secured, how to keep up the interest is the question. Success in this depends largely on the quality of the programmes and the manner in which the meetings are conducted. Choose those subjects that are of interest and value to all classes, and prepare the programmes a few months at least in advance. Then anyone not able to attend all the meetings will choose the subjects of personal interest. The president should understand and be able to give information on each subject in order that she can supply the place of absentees, or, if a paper is not complete, can add necessary details. For assistance in this she should be able to depend on her vice-presidents. There should be no drones in any office. The meetings should be so well arranged that a woman would feel repaid even if attendance entailed a drive of five or six miles. If a meeting is a disappointment and a failure it will occasion much more talk and attention than half dozen successfully conducted ones. There should be no disappointments.

Do not be content with subjects already worn threadbare, nor with those that apply to work, or even methods of making work easier, admirable as those are. Have some intellectual subjects; something on current events. We are making history rapidly, fast building up a nation, and we women must keep pace with the times. Impart information on such lines that the busy woman with little time for reading can gather food for thought in busy hours, and information to impart to her children; and the society woman may find the wherewithal to make conversation pleasant and agreeable, and keep abreast with or ahead of her husband on affairs.

We want something to amuse as well as instruct. Music you will have of course, vocal or instrumental, the latter serving well for opening the meeting; recitations occasionally, and certainly carefully chosen selections for reading. The range of subjects is very wide. To the preparing, cooking and serving of all kinds of foods, varied by an occasional cooking demonstration, the study of their properties and values, so important for health and economical housekeeping; the care and training of children and kindred subjects, why not add a lesson on home dress-making, millinery and fancy work? Many of the dainty trifles that add to the comfort of the home or the beauty of the table can be easily made in odd moments if you only know how, and are very expensive if purchased.



If you have ladies unfamiliar with country life, introduce an occasional paper on some of its many interesting and delightful phases,—the springtime, with its ever recurring mystery of the awakening to life of earth with its myriad treasures of field and forest; the time of blossom-laden air, and the bustle of seed time and harvest, not putting in the foreground the work day side, nor clouding the back ground of the picture with trials and difficulties. If you have a subject that you think pertains exclusively to life in town, give it to some right clever country woman, instead of taking it for granted she knows nothing about it, and I shall be surprised if she does not astonish you with an excellent paper. I find that where the ladies are accustomed to work together in church societies, ladies' aid and missionary organizations, they understand each other's capabilities and find little difficulty in carrying on successful Women's Institute work.

The question box affords the means of giving variety to the programme, and also affords an opportunity to the timid woman to gain information on any desired point. If skilfully conducted, it tends to promote discussion, that feature in which so many fail, but which is so important. Every possible effort should be made to promote the free exchange of thoughts and opinions.

Have some good magazines and keep them well circulated. Every properly managed Institute has ample funds to supply magazines. Arrange discussion on subjects brought out in these, to ensure their being read. Keep the benefits and work of the Institutes well before the public. Make special efforts to add new members. Changes are constantly occurring in town and county alike. In one word make your meetings so interesting, profitable and enjoyable that no one can afford to remain away.

## HOW BEST TO SECURE THE CO-OPERATION OF TOWN AND COUNTRY LADIES.

BY MRS. L. R. LEMAIRE, WESTON.

May I claim the indulgence of the ladies, and hope that Mr. Putnam may not be sorry for having placed my name on the programme for a few remarks on the subject of "The best way to secure the co-operation of town and country ladies"?

First. I am convinced that we must believe in the efficacy of the Women's Institute, or we shall not be able to talk about it. We should take every opportunity to bring it before people as being a benefit to women. Never miss a chance to put in a few words concerning the Institute. This may be done in your home, on the cars, at social gatherings,—any time, anywhere. Of course we must be careful not to over-do it, but with a little tact we can always mention some good idea that would be of benefit to those with whom we are speaking. There are often occasions when we can tell of some delicious recipe, or of some useful knowledge we have obtained from some of the members.

We should invite outsiders to come and bring some of their friends with them. By these means we advertise our Institute and in many cases secure new members.

Second. We should have a programme that is attractive, interesting and beneficial. Then those that read them will be led to see for themselves that our Institute is not only for a cooking class, but also for imparting knowledge in hygiene, sanitation, ventilation, and everything pertaining to

the welfare of woman. I believe in distributing these programmes to people whom we think may possibly become members.

Third. We must be sociable. Let us occasionally have a cup of tea quite informally at the close of the meetings. A little "gossip" will do no harm, and incidentally we may tell of our experiences, failures and successes in our different work. In this way we may often bring out ideas, and set the ball rolling. Truly there has never been a meeting at which we have not learned something new and beneficial.

Not only may our meetings be sociable, and a resort for getting recipes to cater for our homes, but let us also have intellectual treats. Let us have a good reading or a comic story,—for I believe we do not laugh half enough to keep ourselves young and in good spirits and good health.

Do you not see that in our meeting we thus become broader minded, love one another more, and incidentally are taken out of our old routine.

It has been my desire to get young girls from the ages of fourteen and fifteen to attend these Institutes. As yet I have met with very little success, but I think by a little help from others I shall yet succeed.

Thank you sincerely for your very kind attention. I will conclude by giving you our motto: "Loyalty, Sociability and Progress."

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### COOKING DEMONSTRATIONS.

BY MRS. J. W. COHOE, NEW DURHAM.

When the secretary and president of our Institute went to the County Council asking for a grant to aid us with our work, the members that we spoke to privately assured us that they were in favor of helping us, for there was need for our women to learn to cook. Personally, I thought that was the least needed of any of the subjects connected with institute work. After placing before them the aims and objects of the Women's Institute, also what we as a District Institute wished to do at home, and our need of money to carry on our plans, the warden kindly assured us that he was very much in sympathy with our work. He thought our wives and daughters ought to be taught how to cook good meals, for without them the homes of our country would be very badly off indeed. He rather inferred that there was need of this training. I fancy these men all thought it was the other fellow's wife that needed the training. The men all agreed that the cooking of good meals ought to be encouraged.

The delegate with the "cooking kit" has certainly been a drawing card at our meetings, though I know that sometimes it is a decided inconvenience and care to the said delegate. I was delighted and instructed as I went around with the delegates in June, and saw the dainty and toothsome dishes made from unsightly and ragged pieces of meat.

On the farm the vigorous exercise in the fresh air creates such a hearty appetite that we are not worried with left-overs. Therefore the underlying principles of the cooking of foods is more important.

Usually we think of elaborate and fancy dishes when we speak of fine cooking. I was pleased with a sentence in the August number of "Good Housekeeping," in the article on "The Shaker's Fine Cookery." After describing the materials used, and the manner of cooking and serving, the writer says: "When we remember the intelligence and rivalry of the cooks we begin to understand why the food although so perfectly simple is so delicious." Good work has been done along this line in getting the mem-



bers interested and the Institute started, but I believe that in many instances where the members are interested and attend, the principles of cooking, sanitation, ventilation, and all other subjects that women are interested in as home-makers, might be taught as well by lectures, addresses, or talks, as by demonstrations. One sister will get a helpful thought and pass it on.

An illustration occurred to me. You remember that Mrs. Laws described to us at Guelph a year ago, at our convention, a fireless cooking box. Many heard of it here for the first time, then read about it in the papers, and tried one at home. This same box is being used in the far west in Seattle, where fuel is high, and in the south where it is too warm to have much fire.

It is the sweet spirit of helpfulness coupled with a willingness to learn, that is going to make our Institutes a success and a power for good.

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## COOKING DEMONSTRATIONS.

BY MISS LULU REYNOLDS, SCARBORO JUNCTION.

Demonstrations have done and are doing the work for which they were intended. For introducing the work, and for newly organized Institutes, probably nothing could take their place in creating interest, thus teaching the lesson for which they are designed,—that of the proper method of cooking the two important divisions of food, viz., proteids and carbo-hydrates.

The older Institutes should now be prepared to advance along other lines, having heard the same story, with a little variation, a number of times. Going to a meeting, seeing a demonstrator make two or three new dishes, is not very instructive to the average housewife. It may be entertaining, and the dish may tickle the palate; but too many housekeepers think entirely too much about cooking already. If the housewife would do less cooking and more thinking, reading, and travelling, the standard of our farming communities would be raised to a higher level. Too many women in country homes do not improve their minds as they should. The scarcity of help in the home and on the farm, make it hard to find time for quiet reading and thought, which is so essential for the development of an all-round mind.

If we could so plan our cooking and our work that we could spend even a few minutes each day in systematic study, we would soon become interested, would benefit ourselves, and in turn be able to give useful information to others.

There are numerous subjects which should be intensely interesting to the housekeeper, such as gardening, care of plants, training of children, nursing, ventilation, sanitation, hygiene, physiology, dietetics, and many others.

The narrow-minded person is the one who reads little, thinks little, travels little, but who too often prides herself on her home-keeping qualities. These are all right in their place, but it would be just as well not to keep them there.

Cooking demonstrations have the tendency, of course, to encourage good cooking and more of it, when too often the class that is drawn to the Institute meetings needs discouraging in this very line. If we could but get

together the class that forms such a large part of our communities, demonstrations would certainly be invaluable for an indefinite time; but it is the intelligent housekeepers who largely attend our meetings. Cooking in schools would be the only way of reaching the former class.

We must progress not on one line, but along all lines; and whatever we do let us do it the best of our ability.

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### COOKING DEMONSTRATIONS.

BY MRS. COLIN CAMPBELL, GODERICH.

I believe the demonstrations are productive of much good, and prove a good advertisement for the Women's Institute. If you desire a large attendance at an Institute meeting, just announce that there will be a demonstration in cooking. The majority of members take a deep interest in this feature of our work, and are willing to give what information they can, as well as receive what others study so diligently to prepare.

After one or two demonstrations have been given by delegates sent out by the Department of Agriculture, several Institutes have taken up the study of the relative value of foods, uses of food to the body, etc. I consider the study of foods one of the most important topics to be taken up at Institute meetings. There are many things we all want which are not really needful for life. Food we must have or die. Our food must be inviting. The road to the stomach is past eyes, nose and tongue, and each of these gate-tenders may have somewhat to say about what shall pass. If their protest be unheeded, a psychological remonstrance through another set of nerve centres reaches the stomach by another route. If vigorous enough it may at once return the objectionable stuff. If of less vigor it may so impair the functions of the stomach that the digestion is imperfect, which means suffering to the whole body.

We as a nation consume quietly, and to the great and continuous benefit of the patent medicine maker, food poorly chosen, poorly cooked, and warranted to ensure the continuance of dyspepsia. It is the function of good cookery to make all prepared foods as inviting as possible. I would suggest that Institute members study the chemical, physiological and economic value of foods.

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### THE EFFECT OF HOME INFLUENCE UPON OUR NATIONAL AND POLITICAL LIFE.

BY MRS. A. H. BACKUS, M.D., ALYMER, ONT.

Looking casually at the subject it would appear that woman's influence upon the national political life of a country was important, but a nearer study shows that national history is written at the fire-side by our mothers; and if our national history is mean and contemptible, it is because our mothers are weak and thoughtless, and if it is brave and just, it is because our mothers are patriotic and thoughtful. The fact is acknowledged and deplored that our women lack patriotism, taking little interest in either national or political questions; and it is the same in both country and town.



In the country is the work of the house, in the town social duties, that fill the lives and the thoughts of women. And the disregard of these questions,—(our political and national life) is already showing in the national and political doings of our country. Patriotism and integrity are becoming unique virtues; men will do in national and political affairs things they would never dream of doing in the commercial world. We are losing that fine sense of honor which should be our proudest boast, and the cause of this is the indifference of women,—(our mothers and home builders) to national subjects. The love of country has ever been considered one of the highest virtues, it has ranked in all nations as next to love of God, and in those Empires which have been greatest and during the periods of their noblest prosperity, you will find patriotism was a household text.

"If you would know the political and moral status of a people, ask what place its women occupy," says Louis Aime Martin, that upright and talented French writer who died in the last century; and in the treatise—"Education des meres des famille"—from which our quotation is taken, he asserts that the only means of improving mankind, is to educate women in such a manner that they may be enabled to form men of virtue.

There is in America a good translation of this book, and it contains many practical and useful hints for women.

Harder in his *Philosophy of History* writes,—“There is nothing, I think, which marks more decidedly the character of men or of nations than the manner in which they treat women.” And recollect, the manner in which men treat women is entirely in the hands of women.

The sons of brave and upright women treat women with consideration and respect.

Truth and justice are the foundation stones of character and they must be laid in youth by the mother. There is no chance work about it, the mothers build the character; and if our men are weak and characterless, it is because our women are lacking in courage and integrity.

Women who are worthy do not become the slaves and toys of men. Neither do their children grow into bullies and cowards. There is an old proverb which says,—“Show me a man’s dog and I will tell you the kind of man he is;” but a better proverb is “Show me a man and I will tell you the kind of mother he had.”

Perhaps women are too fair to blame men if national and political conditions are not just to women, but the blame must be traced farther back; in fact we can follow it to the home where the mother forgets her duty to herself and becomes a household drudge instead of a woman of thought and reason.

The day that God sets the seal of Motherhood upon a woman she should feel the sacredness of the position she holds. You know we hear very much in these days of “Race Suicide,” and we have Mr. Roosevelt of the United States and Bishop Williams of Ontario, (with sundry smaller lights), screaming for a larger birth rate. Now perhaps if these gentlemen would give some practical solution of the problem of domestic help before starting out with their clubs to enforce their wishes, the results might be more satisfactory, and make reform in this particular at least possible. However until some practical answer is given to this problem men and women will continue to regulate the members in their families, and that without breaking the laws of either God or man. We have in country and town habitations where women are weak, and men thoughtless, where restraint is unknown, and sanitation unheeded, where ideals are low and ambition base, and in these so called homes, children galore. And it is from these habitations our jails

and reformatories are so plentifully recruited. Large families do not necessarily indicate the intelligence or prosperity of a people, and a prolific race may be of short duration. Quality should be the first consideration. A few good, strong, temperate, brave men and women is better than a host of weaklings.

Of course you all know that the history of the past reveals the fact, that when a race, (be it in the lower animals or higher animal man) ceases to fill the need or part for which it was created in the world, that race becomes extinct. We can see an example of this in the passing of the Indian. The mysterious laws of nature work in a way which we are only beginning to learn; but so long as there can be found "within the city ten righteous it will not be destroyed."

This seeming loss of the instinct of philoprogenitiveness in the world of to-day, is simply nature's way of saying these people are not worth reproducing. And when you look about at your immediate acquaintances, you will see how many are unfit, physically and mentally speaking for the duties of parentage; and the world is better off that no offspring has been given them. The cause of this condition is the lack of proper education and outdoor exercise for our young women, and the remedy is already being applied in our open universities, and the larger life given to women. In the early days of this country, when the homes were scattered and social life a thing to be enjoyed only occasionally, when men and women had one and the same object, the making of the home, children were plentiful and welcome, and being welcome were strong and happy.

But there came later that period of transition, girls were in many cases uneducated, boys became selfish, and being uneducated, women placed too high a value upon social success. Young men clamored for place and position, to get rich quickly was the object of man, to dress and be in society the ambition of women, so children became a nuisance.

But this was simply a transitional period among a certain class, not a universal thing, and a better state of affairs is now coming to pass.

Those careless ones even are learning that motherhood must be revered, and parentage is a sacred duty, not an idle holiday, and all the world is realizing that Home means as much to the nation as the individual, for it is in the home that all national greatness is founded, and the object of home influence upon the national life is so far reaching that not a monument can be placed in a public park or a vote be given in our houses of Parliament that cannot be traced back to the ideals, and traditions of home and childhood.

As an illustration of this,—About two hundred and fifty years ago Geo. Hopkins left to the city of Hartford, one thousand pounds for the building of a Grammar School, and to-day in that city stands the square red brick building and set in its walls in white brick, a few feet beneath the cornice, standing out distinctly, that 'he who runs may read' is this text, "And all thy children shall be taught of the Lord, and great shall be the peace of thy children." Isaiah 54. 13.

It is not difficult to picture the home life of a people who would choose this form of decoration for their public buildings. Homes crowned with Godliness and fastened with integrity.

Neither is it a matter for surprise that the children coming from these homes were brave and intelligent, and to-day in their descendants we see how far reaching is home influence; The New England state of Connecticut has supplied that nation with many great and good men, and as we would expect from this circumstance, the women of Connecticut are famous for their piety, their intelligence and their strength.



A child's education should begin at least nine months before its birth. "I will give him unto the Lord all the days of his life," said Hannah, and thus made possible Samuel's pure life even before he was born. Perhaps the first thought that comes to the mother when her babe is put into her arms is, how am I going to protect this child from the idle vanities that have so often carried me off my feet?—And even this thought helps the child. To trace the mental and moral influences of the mother upon the infant, particularly during the period of nursing is most interesting, and a knowledge of these influences every mother should have in detail, for it means moral and mental well being, not only to the child, but for all its life long; and not only for the present generation, but those who follow, reap the benefit of the knowledge and wisdom of the mothers. Thus it is the foundation of character is laid. Our fathers give us our physical strength, our mechanical skill, our musical talent, our mothers supplying our spiritual integrity and mental ability.

It is also the father's privilege to furnish the means for physical necessities of wife and children. It is the wife's and mother's privilege to see that this means is wisely used. So our girls should be taught the value of food materials. The physiology of dress, and all pertaining to sanitation and health.

As the child grows it is the mother who must look after its environment. Food, raiment, fresh air, proper breathing, exercise, companions, books, and all those sacred and precious memories which should be included in the word Home. And the dearest of all, is the memory of an intelligent mother.

There can be no pleasure in the memory of a household drudge, no pleasure in recalling a work worn woman, indifferent to the great world about her, a slave who wrought only for her husband's and children's physical welfare.

We want to remember our mothers as good women, who ruled their households with wisdom and love, who laughed and made merry. Who had their own thoughts on the question of the day, but were ever tender even to the lowest forms of animal life. And this is the kind of mother that fills the nation with good brave strong men and women, and this is the sort of mothers you will find here and there in our country homes.

And when you see great and good men working for justice and the country's good, not for their own aggrandizement, you know there were great mothers who made it possible for them to be. There is no happier thought in the world than the thought of a just mother, and perhaps none are more rare. This is often the weakness of the home, that mothers have a different code for the conduct of boys and girls. While the boys are out fishing, playing ball, and all sorts of sport, the girls are kept in the house at work. And when the boys return from their games, the girls are expected to wait upon them. Now there is no justice in this, and as the weakness of the home must ever become the infirmity of the State, boys, being taught in youth to ignore the rights of their sisters, become selfish and are not always either just or gallant in their dealings with women; and even in legislation, governments have been known to pass laws not altogether fair or generous to women.

So you see the mother's training and example affects in a disadvantageous way the interest of her daughters. Now as the girls require as much fresh air as the boys, and as women have even greater need for physical strength and courage than men, enduring as they must pains and dangers from which men are quite exempt, girls should be given every opportunity in out door sports to develop both courage and strength.

It is the brave mother who gives the world brave men; and neither physical strength nor moral courage can be developed in the growing girl, by

keeping her in the house. Let us give our girls the same chances as we give our boys to equip themselves with strong bodies and clear minds. The welfare of future generations depends upon this.

A nation's greatest wealth is the happiness and prosperity of its homes, and as it is not possible to make homes without women, you see then how much the nation is indebted to women, and what responsibility lies in women's hands, and why they should be patriotic.

Concerning the home, it is the mother's land to control. She must regulate the sanitary conditions, she must look after the mental influences. She should interest herself in the schools and school houses where her children attend, and the man of the house should aid her in all her efforts.

Then in the moral affairs, it is the mother who must fix the ideals, who must set the standard of integrity. So you see women must think for themselves and in the sanctity of Home (as well as in co-operation with others interested in the great national work of Home building) work out for themselves and their children a scheme of right living and right thinking.

Concerning the education of boys, there is one lesson which should be impressed early in youth, and that is consideration for all animal life. Teach them how dependent we are upon these patient, useful creatures (our domestic animals); let them realize that without them we could not live, and that we owe them a debt of gratitude for all they mean to us. Let boys feel that cruelty, and the indifference to cruelty are the characteristics of cowards, and the real mark of a gentleman is kindness and consideration to all creatures depending upon him.

Perhaps the greatest need in the education of our daughters is to give them some knowledge of our civil laws.

You all know the legal maxim which says, "Ignorance of the law excuses no man" and much less does it excuse women. There are many cases on record where women have signed away their birth-rights and dowers, not knowing what they did.

An old custom which has caused more heart aches and tears than the world has ever dreamed of, must be changed before we can have the model home, that is the custom of leaving farms and estates to the boys, ignoring entirely the claims of the girls.

Our girls must be given full justice in the Home before the evolution of the best of womankind can be brought about. And until we have the perfect woman we cannot have the perfect home, or the perfect nation.

In the striving for the ideal home, there must of necessity be many failures, and many disappointments, but in the very act of striving we are building up a nation, and our mistakes and failures are helps for the future; for it is out of our mistakes we must build bridges for our children to the promised land.

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## ENTERTAINMENT IN THE HOME, GAMES, ETC.

BY MRS. JAS. ARMSTRONG, GORRIE.

There is no sight more pathetic than unamused childhood, and our strongest sympathies are aroused for the child whose mother pushes it away, telling it to "go play with something," when the poor little thing has exhausted its resources and knows not what to do next. Children should have two distinctive kinds of amusement, those that are active—yes, and noisy too, and bring into play all the muscles—and those that are quiet, bringing into use as much the mental as the physical faculties. It is easy enough



to find plenty of the former, even though the mother possesses but little inventive genius along that line, for there are few children that cannot think of something to keep themselves going. But when the mother is through her active work and sits down to sew, read, or rest, she usually wants the little ones also to be quiet, and is often sorely puzzled to know how to keep them so. The happiest children are those whose minds are full of something all the time. But there is a vast difference between having something to interest and something to amuse them. The former causes a state of perpetual content, the latter calls for perpetual renewal. Some parents keep their children quiet without any apparent effort. Enter their homes and you will find that the attention of even the youngest is claimed. Perhaps a tower is being built, block after block being placed in position, and the little ones watch its progress with breathless interest. The little minds are alive with ideas. Persons who have the gift of interesting children have usually the greater one of teaching them to amuse as well as interest themselves. Quite young children can be trained to amuse themselves. The children of the poor learn this lesson of necessity. The children of the rich are happy in proportion as they are taught it. Happy the children who learn, before they can talk, to amuse and interest themselves, and happy the mothers who have the gift of teaching their children this lesson. No sensible mother expects old heads on young shoulders.

Let the children see that you take an interest in their enjoyments. Enter with a will into their amusements. Spend some time to brighten their lives as you go along from day to day. Encourage the little ones to sing; music lessens care and heartache. Often and often the words of a song linger in the heart after the voice is silent, and keeps alive the courage that had almost died. Song sweetens toil, and it is imperative that parents should aim to increase this means of happiness for the children, if for no other reason than to strengthen their minds and hearts for the labors to be borne in older years.

Rainy weather is hard on children, because it often deprives them of their active out-door amusements. A child's mind is so active that it is never without employment. What wonder that the busy little hands, guided by a busy brain, often finds so much mischief to bother mother. There are so many pretty things for them to do, if the mother will only take a little forethought for them. What fun a child can have with an old catalogue and some pencils. The flower seed and fruit catalogues come into nearly every home, and a few pennies will buy the pencils. They will afford an entertaining occupation, from the little mother to the quite big sister, who can try to color the sweet peas and pansies. All small children like to sew, and boys as well as girls ought to be encouraged in the use of the needle, and thus they will spend many quiet hours that will be instructive as well as amusing. A slate and pencil will afford much amusement for little folks, and a pencil and scrap of paper will often drive away a fit of the blues. Children should be encouraged to write letters and read them too, not only as a source of amusement, but education as well, and many children have spent many happy hours at this amusement. Making a scrap book is a never failing source of amusement for children and young folks as well. If the children are old enough to sew and make dolls' clothes, dolls will be found a source of great pleasure and profitable as well, in that it teaches them to sew.

Some mothers may say, "these amusements are mostly for girls—what about the boys?" Our reply is "teach them just the same as the girls." The best safeguard that a boy can have in after years is an early training and playing with girls, and let the girls join the boys in their games. The

boys will be manlier, more considerate men, kinder and more courteous. The boys will learn that it is as bad for them to be immoral as for their sisters. I do not like to hear a mother say "I am out of patience with my boys, with their noise and disorder. I never have a moment's peace until they are out of the house." Oh mothers, what are your homes for, if not to protect, develop, brighten and make happy the lives of its inmates, including those same troublesome boys? The noisiness and restlessness which characterizes boys at this stage is simply a superabundance of energy possessed by them, which, if wisely directed into a proper channel, would make of them now, bright, chivalrous, loving "Mother's boys," and later, noble and high-minded men.

Supply interesting reading for your young folks, such as books of travel, biographies, books on exploration, children's books on the sciences, geographical and historical stories, a few of the classics, and some magazines and papers and current events. Teach your boys to take an interest in the natural and animal world. Talk to them, and fill their minds with the good, useful and wonderful things of God's kingdom, and there will be little room in it for the vice and cruelty that otherwise might some day break your heart. Some one says, "I have not time." You must take time. Do not fall into the mistake so many mothers make, that their chief mission in regard to their children is to keep them well fed and well dressed, but enter heartily into all their pleasures and frolics. Encourage your children to urge you to join all their games. Look at your boys' curiosities,—for what boy has not his pocket full—talk of them; be interested in your girls' doll clothes, and, as they grow older, in all their entertainments at home and abroad. But you complain, "They make such a litter and mess." Yes, undoubtedly they will, but what is a little disorder in comparison with the salvation of your girls and boys. If you have not an old cupboard or closet in which your boy can put his collection of curiosities, nail up some shelves in a corner of the woodshed and let him have it for a museum. Encourage him to observe the habits of birds, animals and insects. Talk to him and tell him simple stories about them. He may never be a great philosopher, but you will make him observing and happy. It is yours to guide that boy aright, to build him up in unselfishness, kindness, purity of mind and word. No game of politics or business in after life will ever be so important to the man as the ball and top to the little lad; and no future enjoyment of the little girl will ever be greater in degree and kind than her present pleasure in her dolls and playhouses. Remember that indulgence is not always kindness. I remember reading a story once of a mother who let her favorite son saw up all the drawers of a handsome bureau in his playroom, placed there for his tools. He destroyed all the drawers and received no reproof, his mother simply sending for a carpenter to replace them. Of course, some boys are naturally more destructive than others.

Childhood's capacity for pleasure is immeasurable. It is wise to encourage the habit of making the house cheerful, and its inmates happy. This world is not a vale of tears, nor were the people in it intended to be miserable. God's sunbeams dance and sparkle as brightly on the bare kitchen floor as upon the drawing room carpet, and the cottager's child should be, and has a right to be, as happy as that of the millionaire. It is the spirit within, rather than the materials without, that makes real happiness. Pleasures may be high-priced, but real happiness is no dearer than day-light. It is certainly most commendable to love to make young folks happy and to help them to be so. Reading or telling stories is a source of great entertainment to children and young people, while, by constantly leading them



to dwell upon the good and beautiful in life and literature, their minds will be so filled with helpful and inspiring thoughts that there will be no room left for thoughts of a demoralizing character. A child must have a large measure of love in his nature; and just as plants need the sunlight, so he must have love, if he is to attain the highest physical and mental development of which he is capable. A dull, dispirited looking child will brighten up wonderfully after an affectionate little frolic with one of the elders of the family. Simple amusements, merry innocent jokes, much laughter and play form a most important part in the upbuilding of a good constitution. This is neither spoiling or indulging children, but giving them what is theirs by divine right.

Sports that tend to give a child an ideal of physical perfection are good. The small boy's boast of "feel my muscle," is a good one to encourage, and if an appeal to a girl's vanity results in squaring her shoulders, elevating her chest and clearing her complexion, by all means make that appeal. As mothers we should take an active and practical interest in our children's entertainments and games. It seems in keeping with the fitness of things that children should interest themselves in gardening, for nature is seen at its best among the flowers. We always associate freshness, purity and sweetness with the flower garden, and these surely are things which it is good for children to love. There are few boys and girls who are not fond of plants, provided they are taught to regard them intelligently. Give the children a garden which they may call their own, teach them how to work it properly, explain to them the reason for the various processes, and they will take a great deal of entertainment from their garden. Children should have plenty of games and be allowed to make a noise. Noise making is said to be a most hygienic exercise for children. Young people also must have entertaining amusements. There are a great many games that will help to while away the long winter evenings. Mothers, join with the young folks in these games! Almost all homes have a piano or organ. Let it be heard very often, and the fathers and mothers should join with the young people in singing. The christian home includes the parlor with its games and amusements of our children and young friends. It is as important and responsible as the nursery or any other part of the home. The choice of companions and amusements are all involved in the home parlor. If we would, therefore, escape the shackles and contamination of corrupt society for our young folks, we must hold the parlor sacred and give to it the air and bearing of a moral aristocracy. In the parlor or in their games they often make their choice of companions. Their hearts are developed, their minds trained for social life, and influences are often brought to bear on them, which may determine their weal, or their woe. Christian parents should guard their parlors from social corruptions. It is, therefore, beneath the dignity of christian parents to permit their parlor to become in any way a prey to immoral and irreligious associations and influences. Here is, indeed, the great fault of many Christian parents, that they do not exert that guardian care they should over the social relations and amusements of their children and young friends. Guard your parlor, therefore, from all questionable amusements. Enter into all your boys' and girls' amusements and games. Ever remember, mothers, that the future condition and happiness of your children largely depend upon the kind of amusements you admit into your parlor. Encourage them in all innocent amusements and games, enter into them heartily with your children. But recreation is not necessarily time spent in play alone, an idle or a leisure moment when nothing shall be accomplished. A change of occupation is often recreative. Nearly all domestic work is healthful exercise of muscle and strength, and

it is the privilege of the wise parent to make it so pleasurable that children will enjoy a portion of their time spent in such work as much as if it were spent in play. To spend one's whole time in amusement and pleasure is neither profitable nor right for young or old.

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## TRAINING AND INTERESTING CHILDREN IN THE HOME.

BY MRS. W. P. FLETCHER, DRAYTON.

At first sight the subject may impress one as being very simple and easily dealt with. Some may say, "Every mother understands her own children and knows better than any one else how to train them." While this may be true to some extent, the average mother has not time always to think before she acts in dealing with her children. When one looks more closely into the subject it becomes an endless study, which it would take several afternoons to thoroughly discuss. We may at best offer a few suggestions on the general principles of training and interesting children in our homes.

Some one has said that the training of a child begins with its great-grandfather, which explains itself. If parents would have well-trained, home-loving children, they should be very careful of their own lives. Some of us may be inclined to be rather careless about training our children until they reach what we call the age of accountability. We say that they will learn in time what is wrong and what is right. But let us never forget that the earliest impressions are the most lasting, and that the man is the grown-up boy, and the woman, the grown-up girl. We would not say, keep the child out of the parlor and away from the company until he is old enough to know how to act, but rather, let him use the parlor, teaching him how to respect it and its furniture; let him eat at the same table with the company, that he may learn how to act by precept and example. It will not take him long to learn if he has been taught to act properly in the home circle. It is never pleasant to have a child grow up bashful and shy of strangers. Where possible it is preferable to have a play-room for the children, but even there they should learn to have a place for everything, and before leaving the room to have everything in its place. This would save much scolding in after days, when Willie persists in throwing his cap on the sofa, and May leaves her school bag lying on the floor.

A child must have true respect for his mother, if he would love and obey her. Firmness is very effective in securing the confidence of your child, and rendering the work of training easy and successful. In commanding, use a kind firm voice, think before speaking, keep yourself under control, and having made a right command, stop at nothing short of complete obedience. Reproof is an efficient corrective of most faults. The child-heart is ever responsible to reproof, rightly administered. If a child abuses a privilege, he should be deprived of that privilege for a time at least, until he has learned its value. To threaten a child is never judicious, and to be continually threatening is worse than useless.

The habit of fault-finding is a curse to any mother. Her constant complaints and reproofs soon become utterly devoid of effect, and gradually her influence over her children vanishes. So many of the faults of children arise from an over-flow of childish life and energy, that the judicious parent will find it discreet, as well as kind, to let them pass unnoticed. But serious reproof should invariably follow serious faults, and violation of



principle should meet with suitable punishment. But, while ignoring unintentional, thoughtless errors, be ever on the alert to discover any sign of honest effort to do right. Nothing can strengthen the half-formed good resolutions of a child more effectively than the consciousness that a wise, loving, sympathising mother is ever ready to encourage and assist by a kind word or look, rather than watching to punish for every trivial fault. Use corporal punishment as a final resort, when all reasoning and persuasion has failed. Study the nature of your child and do not be harsh with him, lest you harden his nature. The end of all punishment should be to teach the child to do right because it is right and to avoid wrong because it is wrong. Under no circumstances allow your child, if he does wrong, to be frightened with tales of such things as goblins in the dark, or policeman. A child, thus made timid while young, in many cases retains the timidity through life. Too many mothers and grown people thoughtlessly make cowards of children in this way. The training of children is mostly confined to their early life. A child, well trained from its earliest conception of right and wrong, knows how to respect its parents and strangers, young and old, as well as its home and surroundings.

As children grow older they should be taught that work is honorable and idleness is degrading. Every child should, in some way, be fitted for after life. The mother should, not too consciously, be training her daughter for future responsibilities. A mother should know her children, their feelings, purposes and aspirations and be thoroughly in sympathy with them that she may help them to lay deep, firm foundations for their future calling in life.

The great question with the mothers of to-day is how to interest children in their own homes that they may not seek entertainment and pleasure in questionable places. Here we would suggest that the parents manifest an interest in anything that interests the son or daughter, and do not turn a deaf ear to his or her enthusiasm. Recreation is always necessary to a full rounded manhood or womanhood. Take part in, and encourage any form of recreation that will help the young people to be honest, manly and strong; and avoid that which is weak and debasing.

Music in the home is one of the first and most successful agencies in securing a love for home. If the home is kept well supplied with good wholesome reading, including the latest works of the best writers of the day, interspersed with the best of fiction, our boys and girls will not need to seek the trashy novel that poisons the mind and makes it incapable of appreciating that which is elevating and ennobling.

And added to this, let us ever remember that it pays to have our homes attractive in appearance and surroundings.

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## THE ENTERTAINMENT OF THE GUEST ON THE FARM.

BY MRS. J. S. CAMERON, PORT ELGIN.

When I consented to prepare a few words for this meeting I was so dazed as to be unable to say what part of a generous subject I would prefer to attempt to discuss. So in consequence I shall, no doubt, roam all over the farm.

In the first place, I have an uneasy feeling that it is not exactly hospitable to discuss the subject of guests at all.

Is there a housewife who has been free with her hospitality who has not been imposed upon, who has not had careless and thoughtless guests who have tried her soul and made her wish that she could close up her house and escape somewhere? That is our excuse for the discussion. Now, in order to avoid being one of those disagreeable guests, bear in mind a few ideas. Do not make surprise visits—they are always surprises, but rarely pleasant ones to any one concerned. Some housekeepers are in daily fear of surprise visitors, if they have some among their list of friends, and keep their work at a high tension in anticipation. The postal rates are now so reasonable that one cannot excuse their negligence, on that score. It is only selfishness or laziness on the part of a prospective guest, and surely the hostess has a right to know when visitors, whose presence means a certain disarrangement of the household, are expected, and for how long they intend remaining.

Keep your appointments, if possible. If you have made an engagement, no matter how, the hostess is expecting you; so do not allow a little thing to prevent you keeping it. It is inexcusable to do so.

Another annoyance is to have meals delayed by guests. In a busy household this is often serious, and no matter how entertaining a guest is, the men folk prefer to eat at the appointed time.

Do not get up hours before breakfast and get in the way of the cook when she is busy. She needs some time for her work, and if she is not an experienced demonstrator, much prefers the privacy of her kitchen when busy. Personally, I do not often encourage my guests to be in the kitchen. I am delayed and much hindered in my work.

Elizabeth, in her "German Garden," speaks so clearly my sentiments when she says that she never enjoys her guests until after dinner, when her "soul wakes up" and the cares of the house are off her shoulders. So when I am visiting and am sent to the parlor I always go, for that is the part of wisdom; but I dearly love to watch people cooking.

Sometimes guests are very untidy and leave their personal belongings about. Some borrow incessantly, especially toilet requisites. I have found it simply impossible to keep my pin cushion stocked with toilette, and safety pins, and hat pins. The worst, the very worst thing that can happen, is to have a spoiled child and his devoted slave of a mother stay with you a few weeks. He eats green fruit, regardless of advice, and is sick and peevish. If anyone is in the hammock or porch seats, he cannot be happy until he has tried them all. He interrupts all conversation with his demands for notice and praise. He is a nightmare at the table where his cold milk, hot water, tea and sugar mixture is either too cold or too hot, too sweet or too much. He asks for articles of food not on the table.

But there is an art in being a delightful guest and having a spirit of adaptation to surroundings, an inability to see anything unpleasant, a dislike of gossip and scandal. Indeed, the responsibilities of the successful guest are quite as great as the hostess, and require quite as much effort and time. One must be wise, kind, thoughtful for the comfort of others, unselfish about drives, walks, and little pleasures, and as entertaining as possible.

We might say "if one had a beautiful home, a good cook, plenty of resources, one could be an ideal hostess," but it is more important that you really want your guest, and if you do you are ideally hospitable.

A few simple thoughts that come to me about the entertainment of guests: Do not fuss and worry about their entertainment like poor Martha (we are all Marthas sometimes). It is all very well being Mary or Martha,



the difficulty lies in the necessity of being both rolled into one; and we know that our guests do not come to our homes for the food, but to visit us, though it is also important that they receive some of the former.

It is a habit I have to curiously turn to Boswell's "Life of Johnson" to read the great man's views on different subjects. This time it was in reference to Boswell's proposal to go to live in the country. "Don't set up for what is called *hospitality*. It is a waste of time and a waste of money. You are eaten up and not the more respected for your liberality. If your house be like an inn, nobody cares for you. A man who stays a week with another, makes him a slave for a week." Boswell protested, "but there are people who make their houses a home for their guests and are themselves quite easy." Johnson, "Then, sir, home must be the same for the guests and therefore they need not come," which was very disappointing, because there is nothing more delightful than to visit at a country house.

But Johnson was a great visitor and depended very much on his friends and would fret if they did not come in regularly to drink tea. Still there was much truth in his brusque remark.

When Mrs. Thrale complained to him that she wished to have young people come in for the evenings, but did not approve of card playing, which appeared to be the principal amusement, he told her to prepare some nice confections and sweet meats and a dish of tea and they would come for something to eat when nothing else offered." And this was one hundred and fifty years ago.

Do not begin house cleaning before the guest has got quite away.

It has become quite the custom for guests to do without breakfast if they are very tired and prefer the sleep. It is better to wait for dinner than to have a ten o'clock breakfast.

I have found it a great convenience to send up a tray to those late ones, then the dining room and kitchen work is not delayed, and many people appreciate this luxury. If there is a pleasant home feeling and the guest and hostess are congenial and have some books, music, and comfortable chairs, with shade in summer time, and heat in winter, and an old safe horse to drive around about, the situation ought to be ideal.

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### PLEASING MANNERS.

A person's manner generally indicate his character. They are an index of his tastes, feelings, and temper and reveal the kind of company he has been accustomed to keep. There is a kind of conventional manner, a superficial veneer, used by some people on special occasions which is of but little importance, of no practical value, and as transparent as it is worthless. Artificial politeness is an attempt to deceive, an effort to make others believe that we are what we are not; while true politeness is the outward expression of the natural character, the visible signs of the inward person. Thus a beautiful character reflects a beautiful manner.

There is a vast difference between "society customs" and genuine good manners. The former is a bold but vain attempt to imitate a noble virtue, while the latter is the natural expression of a heart filled with honest purposes. True politeness must be born of sincerity. It must be the response of the heart, in other respects it makes no lasting impression, for no amount of "posture" and "outside polish" can be substituted for honesty and truthfulness. The genius of a person may for a time hide many defects, but the natural character cannot long be hidden from view; the real person will sooner or later come to the surface, revealing its defects, natural inclinations, and personal characteristics. Good manners are unfolded through

a spirit imbued with unselfishness, kindness, justice and generosity. A person possessed of these qualities will be found gentle and polite. Good manners are very important factors in our education, and cannot be too strongly emphasized when we realize that they are but the visible expression of inward virtues, and, like the hands of a watch, show us that the inward machinery is perfect and true. A noble and winning daily bearing is the outgrowth of goodness, sincerity and refinement. History is crowded with examples illustrating that in literature it is the delicate, indefinable charm of style, more than thought, that perpetuates the work. We see that often, more than in any other circumstance, it is the behaviour of one towards the other that promotes or obstructs their advancement and success in life.

The address and manner of a person generally determine his success or failure. How often we come in contact with those whose very presence is repulsive; who appear to be entirely void of noble qualities, while on the other hand, we meet with those whose personality is like the pleasant rays of a June sun, warming and gentle. The friendship of a person of genial character is courted and sought, while the one who is cold and gruff is avoided or his presence endured no longer than is positively necessary. We are all creatures of conditions and circumstances and dependent more or less upon each other in all the walks of life. In this day and age, under the brisk competition of patronage in every department of human activity, the expression of the nobler qualities of mind and heart counts much for capital and trade. The person whose heart and life are right will exhibit those winning qualities so universally admired, and will secure the cordial approbation and general good will of friend and stranger.

There is no field of labor where good manners are out of place, no condition of even a depraved nature which is not influenced more or less by the exercise of a kind heart and a genial air. Even the brute recognizes and shows an appreciation of kindness. These qualities of mind and heart, cultivated and woven into the fabric from daily life, will yield a harvest of rich fruitage. The world has an abundance of middle rate workers, but it can never have more than enough of those who have added to native endowment discipline and conscientious training. Probably the best gifts which could be bestowed on most of us in any station or occupation would be what is known as staying power. Many of us begin with enthusiasm, but we give out before the end of the day. To adopt a line of conduct, to choose a special study, or to decide on a course and stick to it, is in each case to deserve success if not always to ensure it. The path of life is strewn with the wrecks of those who begun but did not hold on their way. Pleasing manners constitute one of the golden keys which turn the bolts of the door leading to success and happiness.

The great motive power of our conduct is the heart; it is the fountain head of all action. The heart is the great reservoir from whence flows the issues of life.

When the heart is right the life will be right, and success in all its completeness will be the fruit.

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### CHEERFULNESS.

BY MRS. J. H. DAY, GORRIE.

If we are cheerful and contented, all nature smiles with us, the air seems more balmy, the sky clearer, and the flowers have a more fragrant smell, and everything will appear more beautiful. What God is to the



stricken heart which knows how to lean upon Him, so cheerful persons are in the house and by the wayside.

Cheerfulness—how sweet in infancy, how lovely in youth, how saintly in age. There are a few noble natures whose very presence carries sunshine with them wherever they go, a sunshine which means pity for the poor, sympathy for the suffering, help for the unfortunate, and kindness towards all. How such a face enlivens every other face it meets, and carries into every company vivacity, joy and gladness! We always know the cheerful man by his hearty “Good Morning,” as well as “Good Night.” Fog, cloud and vapor might as well try to cling to the sun illumined landscape as the blues and moroseness to remain in any countenance when the cheerful one comes with a hearty “Good Morning.” Don’t forget to say it; say it to your parents, your brothers and sisters, your schoolmates, your teachers, and say it cheerfully and with a smile. It will do you good and do your friends good. There’s a kind of inspiration in every “Good Morning” heartily and smilingly spoken that helps to make hope fresher and work brighter. It seems really to make the morning good and to prophesy a good day to come after it. Be liberal and let no morning pass, however dark and gloomy it may be, that you do not help, at least, to brighten it by your smile and cheerful words.

“A merry heart doeth good like medicine.” It is the duty of everyone to extract all the happiness and enjoyment he can from without, and also from within himself and, above all, to look on the bright side of things. Never be cast down by misfortunes. If a spider breaks his web over and over again, he does not cease mending it. Let us, then, not fall behind the very insect on our walls. If earth is dark, keep your eye on Heaven. With the presence and promise of God, we can bear up under anything, and should press on and never falter nor fear. Do not let the shadow of discouragement fall on your path. However weary you may be, the promise of God will never cease to shine, like the stars at night, to cheer and strengthen. Learn to wait as well as to labor. The best harvests are the longest in ripening. It is not pleasant to work in the earth plucking the ugly tares and weeds, but it is as necessary as sowing the seed; the harder the task the more need there is of singing. A hopeful spirit will discern the silver lining of the darkest cloud. Far back of all planning and doing, with the attendant discouragements and hindrances, shines the light of Divine promise and help. The times may be hard, but it will make them no easier to wear a gloomy and sad countenance. It is the sunshine and not the cloud that makes the flower. There is always that before or around us which should fill the heart with warmth. The sky is blue ten times while it is dark once. You have troubles it may be, so have others. None are free from them, and perhaps it is as well that none should be. What shall we say by way of commending that sweet cheerfulness by which a good and sensible woman diffuses the oil of gladness in the proper sphere of home? The best specimens of heroism in the world are never gazetted. They play their role in common life, and their reward is not in the admiration of spectators, but in the deep joy of their own conscious thoughts. It is easy for a housewife to make arrangements for an occasional feast, but let me tell you what is greater and better; amid the weariness and cares of life, the troubles, real and imaginary, of a family, the many thoughts and toils which are requisite to make the family home of thrift, order and comfort, the varieties of temper and cross lines of taste and inclination which are to be found in a large household, to maintain a heart full of good nature and a face always bright with cheerfulness, this is a perpetual festivity. I do not mean a mere superficial simper, which has no more character in

it than the flow of a brook, but that exhaustless patience, self-control, kindness and tact which spring from good sense and brave purposes. Affairs assume a gloomy aspect, poverty is hovering about the door, sickness has already entered, days of hardship and nights of watching go slowly by, and now you see the triumph of which I speak, for when the strong man has bowed himself and his brow is knit and creased, you will see how the whole life of the household seems to hang on the frailer form which, with solitudes of her own, passing, it may be, under the sacred prime sorrow of her sex, has an eye and an ear for everyone but herself, is full of resource—hopeful in extremities, helpful in kind words and affectionate smiles, morning, noon and night, is the medicine, the light, the heart of a whole household. “God bless that bright sunny face!” says many a one, as he or she recalls that one of mother, wife, sister or daughter who has been to them all that my words have described. Let us try to be like the sunshiny member of the family, who has the inestimable art of making all duty seem pleasant, all self-denial and exertion easy, and even disappointment not so blank and crushing: who is like a bracing, crisp, frosty atmosphere throughout the home, without a suspicion of the element that chills and pinches.

I do not know of a more enviable gift than the energy to sway others to good, to diffuse around one an atmosphere of cheerfulness, piety, truthfulness and generosity. It is not a matter of great talent, not entirely a matter of great energy, but rather of earnestness and honesty, and of that quiet, constant energy which is like soft rain penetrating the soil. It is rather a grace than a gift, and we all know where all grace is to be had freely for the asking.

### THE DUTIES OF A MOTHER.

BY MRS. R. C. NODWELL, HILLSBURG.

The queen that sits upon the throne of home, crowned and sceptered, as none other can ever be, is—Mother. Her enthronement is complete, her reign unrivalled, and the moral issues of her empire are eternal. “Her children rise up and call her blessed.”

Rebellious as the subjects of her government may be at times, she rules them with marvellous patience, winning tenderness and undying love.

Scotland, with her well-known reverence for motherhood, insists that, “An ounce of mother is worth more than a pound of clergy.” Napoleon cherished a high conception of a mother’s power and influence when he said, “The great need of France is mothers.”

The mother is a light that shines and reigns alone in the early child life and she may weave into the life of her children thoughts and feelings that are rich, beautiful, grand and noble, which will make all after life brighter, better and sweeter for them, or she may sow the seed of sloth, indifference and godlessness which in after years will produce a harvest of rebellion, bloodshed and ruin.

A mother’s duties are manifold, sacred and sublime. Among them may be reckoned also the humbling, the trying and the apparently trifling; but they all require the patience of Job, the skill of the specialist, the heroism of a martyr, the diplomacy of a statesman and the exercise of all the Christian graces. Her influence or training makes or mars, raises or ruins the life of the child, the home and the nation.

We have read history to little purpose, if we have not observed that there are periods when corruption seems to acquire a peculiar and fearful sway in the world. And these sad changes are generally attributed to the



influence of some distinguished leader or leaders in wickedness, who impress their own corrupt image on the generation in which they live. But if we would trace the evils to their true source, we must go farther back than to the men who stand thus prominent in producing them. We must go back to the mothers of those men, whose influence upon them in childhood has been corrupting and vicious. Such, the Holy Scriptures inform us, was the cause of that awful wickedness which brought the waters of the deluge on the earth. It was not till the "Sons of God" took to themselves wives of the daughters of men (an unholy and unhallowed alliance) that the wickedness of man became so great on earth, and the same authority frequently alludes to the mothers of Israel and of Judah's kings, when in days of the nation's decline the throne passed in such rapid succession from one king to another "who did evil in the sight of the Lord."

Now, why is all this so carefully noted? It was to show that the curse of the nation was found in the nurseries of her kings where their infant minds were tainted and poisoned by the Jezebel mothers. But if natural influence is thus powerful for evil it is equally powerful for good when rightly and wisely employed.

The inspired penman sums up a mother's duties in these words, "To love her children, to be discreet, chaste and good."

The poet has said, "Just as the twig is bent, the tree is inclined." But who bends the twig (child)? Who has the mind or character in hand while it is yet so flexible that it can be turned in any direction or formed in any shape? It is the mother. From her own nature and the nature of the child it results that its first impressions must be taken from her, and she has every advantage for discharging her duties. She is always with the child, if she is where mothers ought to be,—sees continually the workings of its faculties; when they need to be restrained, when led and attracted. The mind of the child is like wax to receive but like marble to hold every impression made upon it, be it good or evil. Let us, as mothers, then improve our powers as we ought, being steadfast, immovable, always abounding in the work which God requires at our hands, and for our encouragement let us know that our labor is not in vain in the Lord.

Many mothers think they have no time for the mind and soul culture of their children, but we find time for robes and ruffles, for gossip and social calls.

Mothers, put your children to bed and give them a good-night kiss. Make it a habit to talk to your children in order to get from them an impression of their feelings, and no time is more opportune for this than when putting them to bed. This is a time of all times when a child is inclined to show its confidence and affection. All its little secrets come out with more truth and less restraint at this time than at any other.

Mothers, do not think the time wasted which you spend reviewing the day with your little boy or girl. Do not neglect to teach it how to pray, (and why, and when, and where). Always send the little one to bed happy. The memory of this when in the stormy years which may be in store for the little one will be like the star of Bethlehem to the bewildered shepherds. Therefore take heed that ye despise not one of these little ones; but bring them up in the nurture and admonition of the Lord.

The following lines written by Fanny J. Crosby, beautifully expressed my impression of my own mother:—

"The light, the spell-word of the heart,  
Our guiding star in weal or woe,  
Our Talisman—our earthly chart,  
The sweetest name that earth can know.

We breathed it first with lisping tongue,  
When cradled in her arms we lay;  
Fond memories round that name are hung  
That will not, cannot pass away.

We breathed it then, we breathe it still,  
More dear than sister, friend or brother;  
The gentle power, the magic thrill,  
Awakened at the name of Mother."

## WOMANHOOD.

By MRS. GRAY, ACTON.

There is a path which leads through secret places with many windings and delays, out of the garden of infancy, through the bright fields and shadowy groves of girlhood, to the heights of a pure and fine and lovable and generous womanhood. It is not time alone with his blind, onward march from year to year, who makes this upward path. All round the world, the daughters of men are driven before him, they may not linger in garden or field or grove. The compulsion is upon them. But not for all does the inevitable pilgrimage follow a rising course. For some it moves upon a level, dull and monotonous, through all its outward changes, and growing more weary as the light of hope, beauty and joy fade along the lengthening road. For others, by a happy destiny, the journey advances from a bright promise to a better fulfillment, from a morning joy to a noon-day splendor, from the places that are sweet and pleasant in their lowliness to the higher ranges of thought and feeling, with an ever clearer, wider outlook upon life, an ever purer, spiritual air to breathe and an ever deepening hope to make the heart peaceful and strong.

But is this difference among the pilgrims of time made by destiny alone or does wisdom also play a part in the finding and following of the way to womanhood? Surely something more than the increase of years, something more than the unconscious maturing of nature, enters into a progress so reasonable, so beautiful, so triumphant. A true woman is something finer and nobler than an old girl.

There must be an inward choosing and discovery of the best things to live for, a wise election of the powers and capabilities to be cherished and nurtured by use, a steady and willing surrender to the finer desires and aspirations and, above all, an upward look to the highest standard that is visible, yes, and beyond that, to an ideal, invisible save to the eyes of the heart.

Childhood and maidenhood have always an attractive beauty of their own. But with maturity you look for something more, and yet, how many countries there are in which you find something less—a womanhood from which the charm of wild youth has vanished without a recompense. It is not woman's problem only, but man's also; and in some way it presses upon him more closely than upon her.

Never yet was a fine womanhood unfolded in a country where the dream and the desire of her fulfillment were not cherished in the heart of man. Whether we like to have it so or not, we cannot escape from this ordinance of nature. It is the method of divine government, thus far, at least, in the history of the world. Woman is the mould and form of plastic life, the guardian of domestic honor and the mistress of social joy, the ultimate rewarder, or rather herself the prize and crown of man's earthly conflicts and toils.



There must be differences of character and attainment among women, even as there are among men. Heaven forbid the advent of a machine-made womanhood, correct, accomplished, invariable and obstinate. Women have not all the same thing to do, the same conditions to work in; and as their particular tasks and surroundings differ, so must they be fairly and wisely equipped and trained for the duties which are opened to them.

To consider the unfolding of true womanhood in its essential character and to ask in what way it may best be obtained, let us see whether we can find the things which confer on woman, in her full development, her special part and power in human life. Thus we may learn, at least, to trace the trend and direction of the path which leads her to the heights. Let us remember the things which she must have in common with man—the great things she must share with him; and for these there is no recipe but the free and wise and joyous exercise of body and mind and heart.

No matter what a woman's rank in the world may be, there is always one place that will be subject to her sway, wise or foolish, competent or confused. That place is the home. There she must set the tone and make the rules and guide the flow of daily life, else all must run haphazard, discordant and astray.

None are fit to rule but those who have first learned to obey; then the girl who is ever worthy of the rulership of a household is best educated in the obedience of a home. Crowd out the discipline and training of a real home from the life of the average girl, and you make it far less likely that she will find or follow the way to womanhood, but if she comes from the purity and joy of a real home, cherishing its traditions, remembering with gratitude its lessons and its pleasures, it will be strange if she does not bring with her the secret of its charm and the power to perpetuate its dominion. Wherever she goes, it will go with her, this gentle sovereignty, won through obedience and self surrender, like a glimmering halo of light, half saintly and half queenly. The fine observances of courtesy will follow her steps and the strength of honest manhood will be ready to protect her from all insult and harm. She may hold her court in a cabin, but none will enter it without feeling the beauty of her sway. Her fire on the hearth may be lit between the roof of stars and the canopy of her rest may be the green boughs of a forest tree, but the comfort of her presence will be the light of the camp, and the kindness of her heart will encircle it with peace. No change of outward circumstances can estrange or bewilder her, no threatening storm or darkness of night can break in upon the sense of security that surrounds her, or hush the quiet voice of confidence that sings at her side. For she carries warmth and radiance, sweet order and kindly rule within her breast, and to be with her is to be at home.

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## HOME MANAGEMENT.

BY MRS. W. E. OWENS, THORNTON.

The subject of "Home Management" is a most important one; in fact, I know of none that surpasses it. "Home," the very name itself is dear to every one of us and awakens within us the happiest memories of our lives. It was there that we first learned to love and to feel that there was a bond of fellowship and interchange of thought and affection that keep our hearts mellow and prevent us from becoming self-centred, and having an individuality of our own, we are at the same time human links in the chain of

family life, each dependent upon the other for sympathy in the hour of trouble and of gladness, rejoicing in the happiness of others and sorrowing for their sorrows.

I do not agree with those who consider the home as second in importance to the church, for much as I love the church with its sacred surroundings, I would yet class the home the higher, for the home is the nursery of the church and of the world, and in proportion as our children are trained to obey truth, to be honest in all business dealings, faithful to high ideals, pure in heart and life, reverent and true to the worship of God, so in proportion are they of value to the country, the church and the nation of which we are a part. Have we not heard that the homes of a people are the bulwarks of a nation? A nation of homes, such as we and many others are trying to build up, is the surest guarantee of prosperity, progress and endurance.

And now as to managing a home successfully, here I feel somewhat timorous, and, like one of old, would say, "Who is sufficient for these things?" First methinks that there should be wise ruling in the fear of God with a humble dependence upon Him for right understanding. There should be obedience to lawful authority, firmness combined with tenderness and reason, loyalty to each other, unity of purpose with individual ambitions, for there is diversity of gifts in families as well as in nations.

A boy or girl with an intense desire for education and scholarly attainments would make a poor farmer or mechanic, while one who loved the fields or animals of the farm would be miserable and make a complete failure in an office or store. Young people often find it hard to decide their future course in life, and great care is needed in helping them to make a right choice, and there should be persistent and persevering effort to obtain the best results possible.

Home should be the happiest place on earth, and neither thought nor effort should be spared to make it so. There should be cheerfulness without levity, purity not prudery, economy without parsimony, plenty with no waste, comfort but not extravagance, an honest effort to make the best of our business, not simply for the money or good we get out of it, but that we may glorify God by showing to the world that God helps those who help themselves. We think also that in home life there should be time for intellectual culture. In these times of hurry and rush we need a little time to converse with leaders in realms of thought; a home without books or papers would be to me a gilded prison, no matter how beautiful its other appointments and surroundings might be, but care should be taken that these books and papers are in accord with truth and right and that all others are banished. Be mindful of that which our children read, not by a system of nagging and prying, but by showing an affectionate interest in the welfare and enjoyment, recognizing the fact that the spiritual and intellectual should be nourished as well as the physical nature.

It is a well-known fact that a too close application to business makes it a drudgery, and drudgery narrows the mind, cramps and crushes out of our life all that brightens and gladdens human existence.

These are but a few thoughts as to the successful management of a home, much more might be said by those more highly gifted. The management of a home means more than many people think and requires more gifts and graces than many possess. It needs patience, firmness, tact, unselfishness, unbounded love, fair dealing with the children as with other people, all these are needed, and again I say. "Who is sufficient for these things?"



## HOME.

BY MISS L. WEBER, KIMBERLY.

There is no word that is so precious, so full of tender memories and so full of affection as "Home." It takes but little to make a home; it requires little to beautify it; but that little lacking, home can exist only in imagination. To make home beautiful, to give it the charm which it ought to possess, to turn the hearts of the young to it with reverence and affection, can any task be more inspiring or deserving of success?

Young beginners in home making pay much attention to outward surroundings when their means will permit, and if their means are not such as to permit of this, they devote their attention to the furnishing and arrangement of the parlor rather than the other rooms in the house, and are more inclined to indulge in extravagance here than elsewhere.

The basis upon which all homes should be founded is good living, and no matter how straightened the circumstances, how little money there is to spend, this can always be secured if the housekeeper will begin at the proper place, and that is in the kitchen. That they do not thus begin is the reason for so little home comfort in many of the homes and so little restfulness and true pleasure.

The getting of a house does not guarantee the possession of a home, but the presence of a good housekeeper and one who "looketh well to the ways of her household" goes a long way toward making home what it should be, for when the physical welfare of a family is properly looked after the mental and spiritual comfort is almost sure to follow.

A cheerful kitchen should be the first requisite, and it is surprising how careless some people are in this matter; they are careful that the rooms in which they are to sit and receive their friends shall be cheerful, clean and comfortable, but the kitchen is a secondary consideration, upon which dusting, cleaning, and tasteful arrangement and decoration would be thrown away. Yet the kitchen should be the most convenient room in the whole house, for is it not in the kitchen that the housekeeper spends a great part of her time, and if it is not kept perfectly clean it is a sure sign that something is radically wrong.

In regard to providing for the home, it should be remembered that in order to be healthy in mind and body we must eat wholesome food and eat it at the proper times. Plain food made wholesome by good cooking is what is required, rather than rich, indigestible food not well cooked. It is just as easy to do anything properly as to do it carelessly, and this should be remembered when preparing the food for the table. It requires art even to cook an egg so that it is neither a lukewarm fluid or a hard, flavorless ball, and so it is with everything about a kitchen. If housekeeping is going to be a success, as it should be with everyone who undertakes it, it requires just the same care and preparation as it does for any other occupation taken up by our girls.

## THE BACK-YARD BEAUTIFUL.

BY HELEN WELLS, SYRACUSE, N.Y.

The corners of Mrs. Willard's pretty mouth drooped discontentedly, and the white forehead was puckered into a frown, as she stood at the kitchen door looking out upon the scene before her. "I'm tired of it all," she muttered.

A soft arm stole around her waist, and a sweet, womanly voice asked cheerily, "Tired of what, little one?"

"Oh, Auntie! I'm so sick of this old yard with its smokehouse and pig-pen and barns, all ugly, ugly! I want to get away from it all and look upon lovely things. I don't mind the work, but I so dislike the same old wretched scenes; it tires me," and the blue eyes filled with tears.

"My dear," said the aunt gently, "the true philosophy of living is to enjoy the things by which we are surrounded, instead of longing for the unattainable."

"Enjoy this!" interrupted Mrs. Willard scornfully, indicating the yard with a sweep of her hand.

"We cannot admire ugliness in any form, so let us make beautiful the things by which we are surrounded, that we may be able to enjoy them. This back-yard can be made an ever-changing scene of beauty."

"By a magician?" queried Mrs. Willard skeptically.

"Nothing so wonderful as that," laughed the aunt, "just a little labor and thought is all that is needed. Let us begin with the pig-pen, we admit that while it is useful it is not an architectural beauty and falls far short of being a 'joy forever.' Let us set a hedge of lilacs three feet in front of it, leaving just space enough to pass through to the trough with the feed. Lilacs grow very rapidly, and in two or three years' time will hide the objectionable building, or at least disguise it. They are a bugless shrub and stand the cold winters, and while they are in bloom are very beautiful and fragrant. Even when through blooming their fine foliage makes a fitting background for the row of golden glow, which we will place just in front of them. Set all these roots in straight rows. The golden glow attains a height of about eight feet. About two feet in front of these set a row of sunflower dahlias, whose yellow blossoms are about four feet from the ground and will reach the base of the golden glow's beautiful bloom. In front of the sunflower dahlias sow a row of low-growing calendules, which will bring the bank of yellow flowers to within a foot of the ground. Can anything be more beautiful to look out upon than such a mass of lovely yellow blossoms, extending from the ground up to eight feet in the air against the ground of lilacs? Isn't that an improvement over the bare wooden building you are now looking upon? Every year this vision of beauty will appear without labor on your part and will delight your eye from July until November."

"I have so little time to work with flowers," began Mrs. Willard.

"That is just why I am recommending these particular plants," briskly interrupted her aunt. "You can certainly find time to set them out, knowing that they will reward you with their beauty every year, asking only freedom from weeds; and if you will not take the time to do that you deserve an ugly scene to look upon."

"Why, I don't believe it would take two hours to do the whole," exclaimed Mrs. Willard with animation, "I'll have John plow up the space, and I can set out the plants myself."

"Just ask him to loosen the soil around the smoke-house at the same time," added her aunt, "sow some morning glory seeds in it, run some strings or wire netting up to the roof of the building and you will soon have it covered with the pinks and blues and purples of the morning glories. Every day their sweet faces will greet you, and they will need no invitation to appear next season. Year after year they will nod you a cheery good morning, and you will grow to like them like old friends."



"How beautiful that seems, Auntie," said Mrs. Willard musingly.

"You see, dear," added the aunt, "God gave us a triune nature; we have the three parts in one,—our physical, mental and spiritual; and we can never become perfect men and women until we equally develop all these sides of our nature. We develop the physical by food and exercise; our minds by intellectual food, and by using our minds; and our spiritual natures by all things that lift us above the gross into the realm of beauty,—near to God by being near to the work of His hands. All our love for the beautiful is a God-given attribute,—a reaching upward of spiritual hands, longing to be filled with God's truth and beauty. We are only happy when all sides of our nature are being developed and it is just as disastrous to starve our spirits as it is to starve our bodies. In either case it means death, and so," she continued laughingly, "when we sow grain, let us also sow flower seeds; when we plant potatoes let us plant flowers as well, remembering that 'man does not live by bread alone.'"

"I never thought of the cultivation of beauty as a duty," said Mrs. Willard, "and I certainly never thought of flowers as 'spiritual food.'"

"It is only one little thing in the great plan of spiritual development, but it is one of the helps we can all have, and the best way is to use our surroundings for our own development. We may never be able to travel through the world and gather up its beauties in our memories, but we can all surround ourselves with lovely flower scenes that will give us pleasure all our days."

"What else would you suggest, Auntie?" asked Mrs. Willard with enthusiasm.

"Well," responded her aunt, "one of the necessary but objectionable features of our back-yards is the ever-present garbage receptacle."

"True," laughed Mrs. Willard, "you may scrub. you may cover the pail as you will, but the scent of the garbage will cling around it still."

"An excellent reason for stationing it away from the house, but even this homely necessity gives an excuse for making the prettiest little summer house imaginable. Set the garbage barrel beside the barn and build a fence, higher than the barrel, in front of and on one side of it; plant morning glory seeds, and run strings from this fence to the side of the barn making a bower of bloom. Leave just enough space in front to make a doorway for you to enter, and train the vines the shape you wish. Wild clematis, honeysuckle. or any thick-growing vine will be pretty for this place."

"Why auntie, there are lots of places where one could improve the effect by flowers," exclaimed Mrs. Willard.

"In fact," said the aunt, "we can just follow dear old Mother Nature's example and cover all the old and ugly things with a decoration of bloom. It is always a source of wonder to me why so many farm homes are devoid of flowers, with plenty of space; material for enriching the soil; always some man around; implements to do the work quickly,—in fact everything that is desirable for flower culture, and yet we see bare, unattractive places, and if we look into the faces of the occupants of these homes we will miss a certain spiritual development."

"Don't you think the reason of this is because of lack of time?" asked Mrs. Willard.

"I know one thing," answered auntie, "that if the number of minutes that people spend telling how busy they are, and how little time they have, were spent in actual labor with their flowers the whole country would 'blossom like the rose' and we would all be happier."

## WOMAN'S SHARE IN THE FAMILY INCOME.

MRS. W. G. STRONG, GORRIE.

True economy in the household consists, not so much in that parsimonious exactness, which is the practice of so many women, as it does in the intelligent care and preparation of material, and the perfect adaptation of such material to the individual needs of the family. The subject of economy is very broad, and capable of much expansion, and also many perversions; but we are now in the broad tide of feminine erudition and must bring the collegiate training of the present to bear with force upon all questions of vital importance to society and the home. Some one has said, however, that "Education may work wonders as well in warping the genius of individuals, as in seconding it," and we must admit that this is emphatically true, especially in the case of those women whom a so-called "broad culture" has unfitted for the thorough administration of home duties. Many a young housekeeper, as well as she who is no longer young, feels that it is a hard fate which has consigned her to the monotonous routine of housework, when, by the cultivation and exercise of certain real or imaginary talents, she could shine in the world of art or literature. The point of view is wrong, that is all. The artistic instinct, the deft hand and light touch should the more readily make of home a delightful abiding place. There is nothing in housekeeping which may not be improved by the application of artistic principles, and to acquire the technique of any profession means drudgery of a patient toiling kind. The principles of chemistry, which were mastered in school days, will never come amiss in the home, when the cap and gown of the loved Alma Mater have given place to the housekeeper's apron. Fair girlhood never realizes the "why" of these problems of school life. It is only in the aftertime—when the sweet home duties have come to fill the early years of a happy married life—that a feeling of satisfaction will be the reward of tasks well done; and the discipline of early years should be such as will furnish ample equipment for the solution of problems which confront the housekeeper. No one thing can contribute to the complete felicity of family life in as great a degree as a thorough knowledge and application of the principles involved in the preparation of a successful dinner. Lack of this knowledge is the rock which is responsible for the shipwreck of many a home in this fair land, and no apology is needed for pressing the urgency of this branch of knowledge. Happily the opportunities for acquiring skill and economy in culinary art are more numerous than they were when our grandmothers were young housewives. The cooking schools and household journals faithfully cater to this end. We are rapidly coming to the proper analysis of food products, so that each individual may obtain from the family menu the exact elements needed to renew the store of vital force which has been depleted by his occupation. More and more will the laboring classes come to realize and practice this, and the higher life of the home, be that home rich or poor, be conserved and fostered as never before. In every household there is a place for the veriest crumbs, and no waste should be allowed, even where the counting of pence is not a daily necessity. No housekeeper can feel complete satisfaction in her work unless this matter receives her vigilant care. The secret of poverty in nine cases out of ten is extravagance in the kitchen. This applies, of course, to such cases only where dissolute habits and drunkenness have not wrecked the home, I am speaking of people in humble circumstances who imagine they are thrifty, who apparently have no extravagant habits and yet fail miserably to make any progress in extracting themselves from the slough



of debt. They run bills at the grocer's and at the butcher's, and buy furniture on the instalment plan. There may be circumstances under which it is wise to buy furniture or anything else on the instalment plan, but I doubt it very much. The "instalment plan" has done more to keep people poor than the proverbial mortgage on the homestead. If our means do not suit our ends, we should pursue those ends which suit our means. Many people are ruined not by what they really want, but by what they think they want. Therefore, they should never go abroad in search of their wants; if they be real wants, they will come home in search of them, for, if they buy what they do not want, they will soon want what they cannot buy. A penny is a very small matter, yet the comfort of thousands of families depends on the proper saving and spending of pennies. If a person allows the little pennies, the result of hard work, to slip out of their fingers, they will find that life is raised little above animal drudgery. On the other hand, if they take care of the pennies, putting some weekly into benefit societies, an insurance fund, or into a savings bank and the rest carefully laid out with a view to the comfortable maintenance and education of the family, they will soon find that attention to small matters has abundantly repaid them. There is an old saying that a "woman can throw out with a spoon faster than a man can throw in with a shovel," and no one will deny that this is not sometimes verified. Perhaps the various model kitchen keepers will consider themselves beyond advice, and that already there is no spot or place with them where closer economy could be practised. In cooking meats, for example, do you sometimes throw out the water without letting it cool to take off the fat, or were you ever known to scrape the dripping pan into the swill pail? Because, if you have, closest economy cannot be said of you. There is room for improvement. This grease, if sweet, as it usually is, is useful in many ways and should always be saved. Housekeepers careless in this respect often throw out bits of meat that would make good hash, or bones with meat still adhering, and pieces of fish that could be worked in with left-overs. And can a woman be found who ever throws out vegetables that would warm over nicely? I know of housekeepers who pride themselves on saving ways, but, nevertheless, use nice knives in the kitchen, silver spoons to scrape kettles and forks to toast bread, and will sometimes even take a table napkin for a dish cloth, thinking that they will use it that way just once, but it goes the way of all dish cloths. Every housekeeper must draw the line about her own economies, even if the world stands in judgment on her acts, for every house has its own peculiar needs, and there is a Mrs. Grundy for every corner of the street. But there is a so-called economy that wasteth, and a true economy which profiteth much to the ways and means committee, as well as to all concerned. Indeed, it requires all the engineering of this same ways and means committee to decide sometimes what is best to do. It certainly is not economy in every case to "make over" old garments, and there are women to-day who work from January to December ripping up, sponging, pressing and making over worthless garments. Their life's energy has been wholly misspent, because they could not discriminate between what was good and what was valueless. The woman who boasted that the lining in her black silk waist was made of twenty-three pieces of as many different colors thought that she was economical, but no one agreed with her on the subject. "Will it pay?" should be the first question asked when looking over the old clothes with a view to making them over. Few husbands realize how mean it makes a wife feel to be obliged to ask for money, particularly when she realizes that her better half is utterly blind to the need which prompts her to become a suppliant. A weekly allowance is a good plan, and economy would likely be the outgrowth

of such a plan, for, knowing that so much could she have and no more, the wife would prove her own cleverness by little saving devices that would make the money go much farther than when she gets it in small amounts as she asks for it. Keeping an account book is a practice which develops habits of thrift and economy. The following are a few of the ideas advanced in the topic "Women and Money." "Men are apt to forget what extraordinary changes women have undergone in this century—in the last half particularly. She may have been a financial simpleton in the remote past; she surely is not now in most cases. To-day the average woman understands money as well as the average man." "Man gets his knowledge of practical affairs from constant experience, and wonders that woman does not get hers without experience. When he tries to teach her something about money, its value, its relations, its purchasing power, he finds her quick to learn, and his small exertion in her behalf amply recompensed. Who has known a woman that, having had any sort of financial education, has not profited by it?" "She is, notwithstanding contrary belief, an intelligent economist when she comes to know what economy means. It is frequently said by the other sex that she can make a dollar go as far as he can make two go." "Man, not woman, is the great spendthrift; always has been; always will be. He has dissipated millions where she has dissipated thousands. Squandering is so common with him as to invite little notice; so uncommon with her as to arouse general attention. Her expenditures are, as a rule, on small things." It is to be doubted if, out of a thousand business failures a wife actively and knowingly contributes to one. The plain truth is, if she has any common sense, and is the least enlightened, she usually restrains her husband's tendency to lavishness, and employs all her influence in the direction of economy. Economy is generalship in little things. We know men who live better on a thousand a year than others upon five thousand. There are day laborers who go home to more real comfort of neatness, arrangement and prosperity, in their little snug room, than is found in the lordly dwellings of many millionaires. And blessings be on their good angel of economy, who wastes nothing, and yet is not sordid in saving; who lavishes nothing, and is not parsimonious in giving; who spreads out a little with the blessings of taste upon it, which, if it does not multiply the provision, more than makes up for it in the pleasure given.

Let no man despise economy.

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## COST OF LIVING, AND WASTE THROUGH INJUDICIOUS BUYING.

BY L. DUNCAN, EMERY.

Household economics have been defined as "The relation between the efforts and the satisfaction of the household." Thus we may conclude that household economics means a thorough understanding of good housekeeping and true home-making, and putting into practice this science means comfort and all that goes to make a well regulated home.

As Charles Kingsley expresses it, "The secret of thrift is knowledge; knowledge of sanitary laws saves health and life." It is not only a science, but an art. It embraces the science in the construction of the house, the lighting, heating, ventilation, and includes fresh air, pure water, and the cooking of wholesome and nutritious food. It means also the purchasing of supplies, the making and mending and remodelling, as well as the proper care of clothing, and a careful oversight of each room in the house. It



includes the furnishings, and the proper expenditure of the income. Then, too, knowledge is required of taste and beauty, and the ability to apply that knowledge that our homes, though simple, may have comfort with beauty and harmony throughout. This does not mean a velvet carpet and other costly furnishings for the drawing room, and dilapidated cooking utensils for the kitchen, and it certainly does not mean an overloaded dinner table for the occasional guest, with very limited rations for the family.

Every home-maker should have a pride in knowing how her house is taken care of, even to the minutest detail. Everything should not be left to the maid. What do maids care whether they pay twenty or thirty cents a pound for meat? Their purse is not affected. The ignorant mistress who despises household knowledge and triumphantly boasts, "When I am paying Bridget to do the work I am not going to do it for her," and considers it part of Bridget's duty to do the marketing, may some day realize her mistake.

A capable housewife can sometimes arrange her larder for a week ahead, and avoid daily marketing, thus saving the time that a daily visit would mean to be applied in some other direction. There is, however, another side to this question. In making daily or frequent visits to the stores and markets you can often save ever so much, and be able to set a better table, for in looking about you see things that you had not realized were as yet in the market, or you run across something that a store is making a special sale of on that particular day. This, of course, applies more to the larger towns where there is much competition.

A friend of mine, whom I sometimes visit, has a home in which harmony reigns from cellar to attic. Through judicious planning she accomplishes more than anyone I know. In that home everything is done systematically. By keeping a housekeeping book she knows just what portion of the housekeeping funds is spent on each article: she knows how much it will cost to provide a meal for half a dozen or for fifty persons. Each cent she so expends that the most value can be gotten for it. This, as I said, is due to her previous planning. Although she has a telephone, it is seldom used in purchasing, for she fully realizes the necessity for seeing goods before purchasing. Cash is one of her mottos, and it is certainly an excellent one.

The theory that plain living includes "High thinking" may be entirely correct, but little of it is seen in actual practice. Of all the organs of the body, there is, perhaps, none so badly used or mistreated as the stomach. Irritability, general discomfort and ill-temper are frequently the result of poorly chosen food.

There is an old saying, "a fat kitchen makes a lean will." Buy nourishing food. Eggs are sometimes expensive, but even then are perhaps are not as expensive as would be the same amount of nourishment in meat. When poached or boiled they are distinctly a nourishing diet. Rice may take the place of potatoes, and it is not nearly so expensive, although potatoes are indeed a cheap food. To make rice absolutely nutritious you must boil it until the grains are entirely separated, so that they toss together lightly. Other cheap foods are dried vegetables and fruits. Take for instance prunes, nothing in the line of fruits is nicer than a prune or can be used in more ways or will prove more acceptable as a steady diet. It is well known to be a valuable nutrient. Many people are prejudiced against prunes because they have eaten them under adverse circumstances. When selecting this fruit, take one of the prunes and if pulling and flattening it leaves the skin smooth and shiny, you have a good article; but if they are so hard that nothing short of a sledge hammer would smooth out the creases, and the

surface be broken or marred with fine lines running in every direction, don't purchase them.

It is said that French cooks are the most economical. They know how to prepare the most appetizing results from what we would throw away.

A careful cook seldom buys lard; she saves the trimmings from all meats and the drippings from roasts, except lamb or mutton (which is strong). The trimmings from the meat, she chops and cooks over a slow fire, and re-cooks the drippings till all the moist juice of the meat has evaporated. She then puts this fat away in stone jars for frying fritters, croquettes, fish, and making soup. Yes, the French cook makes what is said to be a delicious soup from these fats. She sometimes has three jars, and into one puts fat for frying fritters and croquettes, another is used for the fat she uses for fish, and a third one for soup. The fat remaining after frying may be clarified and used many times.

Some people mistakenly think soup is an expensive luxury. However, a tempting and nourishing soup can be made from the cheapest materials, including remnants of food that could not otherwise be used. Economy means not merely saving but management, and good economy includes wise spending and using. It is just as wasteful to cook meat too tough to be chewed or digested, as it is to throw away what might be used; thus it is as prudent to purchase vegetables and seasonings to aid in making an appetizing soup or stew out of materials otherwise useless as it is to refrain from buying an article not needed.

Sufficient cooking is required—slow, steady simmering, stewing and roasting. Parboil a piece of meat before you roast it and note the difference; then, too, the water in which the meat has been parboiled may be served for soup for the next day's dinner. Thus, also, water saved from boiling vegetables, with, perhaps, the addition of left over vegetables and seasoning, and fat, makes an excellent soup.

Two articles that it is never advisable to purchase from the butcher are hamburg steak and corned beef. Why? Because the former is never good after it has been chopped for any length of time. Even if the meat used is good it cannot be kept long from decomposing. But unfortunately meat is used for this purpose that can be disposed of in no other way, since it is at least slightly tainted, if not decomposed. That which goes into the brine to make corn beef may not be injurious to the health, but who wants to eat tainted meat, and besides pay perhaps as much as, if not more than, for a cheap cut of meat which could be corned at home; and as for hamburg steak, all kinds of otherwise unseasonable scraps go into it. A powder which gives to it that bright red color is mixed with it. If corned meat be desired, purchase an aitch bone, have the butcher cut it in two, and part of it may be corned and the remainder can be put through the chopping machine; thus you will get hamburg steak that is fresh, juicy and nutritious.

We don't realize what we can do with cheap meat until we mix our brains into its preparation as well as pepper, salt and other seasoning.

Since less than one-fourth of the weight of a dressed beef consists of very tender meat, those parts are expensive, and the less tender pieces being more nutritious are therefore more economical. Prime ribs, however, are more expensive than they seem, for the purchaser pays for so much bone. A cheap piece with much refuse may be as expensive as a higher priced cut. Veal is never economical, since it is poor in both flavor and nutritive value, besides being expensive. Beef is the most nutritious of meats, and



mutton comes next. The tongue, liver, kidneys and heart, as well as some other organs of the ox and sheep are used for food. These are inexpensive food, but are very indigestible.

Sausages are not more economical than other meats. Frequently various vegetable substances are mixed with the meat. Someone has remarked that they resemble life, for you never know what is in them until you have been through them.

In purchasing fish we find that the market price is not an indication of the true economic value. There are fishes with practically the same nutritive value, and one of these varieties may command perhaps four or five times the price that another does. Now we must not for a moment think that none of the high priced fish are worth the price. Take, for example, salmon which contains almost three times the nutritive value as the same weight of cod; thus a pound of the former at thirty cents might not be dearer than a pound of the latter at ten cents. Herring, it is said, offers the largest amount of nutriment of any animal food, for a given sum.

The nutritive value of oysters is not high. It would take fourteen of them to be equal to an egg. At the recent Institute Convention at Guelph, Mrs. Laws in comparing the food value of oysters and milk mentioned the fact that a quart of oysters had practically the same nutritive value that a quart of milk contained, and remarked that since oysters are sold for 40 cents a quart and milk for five cents a quart, you are paying 35 cents to tickle your palate.

We are in danger of eating too much rather than too little meat. Three times a day is perhaps more than anyone requires, and is possibly harmful, except to people actively working or exercising. Some one has said, "We live not upon what we eat, but upon what we digest." No matter how much is swallowed, only a certain amount is made use of; hence the system is over-taxed in getting rid of the surplus. Therefore see that your meat bill is not out of proportion to other household expenses.

Excepting bananas, fresh fruits have little food value. There are, however, in them elements essential to pure blood and tissues.

When choosing vegetables in the market, it is best to purchase those that are in season, since those forced in hot beds or brought from a distance are seldom, if ever, equal to those grown in the gardens, besides being too expensive for most purses. If we know the price of vegetables when abundant, we will not be tempted to pay several times that price out of season. Vegetables of medium size should be chosen, for large ones are less nutritive and require more fuel to cook.

In purchasing flour it is always advisable to secure the high grade patent flour. It is the most nutritious. Those cereals sold in packages have been partly steam cooked in the factory. Yes, you say, it takes less time to prepare them for the table, but have you stopped to think that you are paying for a large quantity of water, and doubtless you will require a fire for other purposes, hence it is more economical to purchase them uncooked, and, too, cereals that have not been partially cooked in the factory will be found to have a better flavor. Oat meal and corn meal contain more fat than other grains, thus are good winter foods.

Now, I would urge all women to keep an account-book, setting down each item purchased and the cost. Yes, perhaps it will take a little time, but how much time have you wasted puzzling your brains to know what has become of that money? Another advantage is that you will know just how much your expenditures are for each week or month. Then, too, when

one realizes that expenditure is too great, it will cause hesitation over the purchase of all articles which are not really necessary to the purchaser. Many women purchase what they deem bargains, and stow them away in closets, and perhaps never find a use for them. If the price of these purchases were set down in black and white so that the victims of these bargain sales could see how much money has been thus wasted, I feel sure that a cure would be effected, for actual figures do look appalling when compared to the stock on hand.

## HOW TO SAVE TIME.

By MRS. JOS. HUDSPETH, CALEDONIA.

The too prevalent impression, that the life of a farmer's wife is one of unmitigated drudgery, is altogether a mistaken idea, inasmuch as it lies within the power of every woman to lessen the hours of daily toil and to find time for some more congenial employment, study or recreation. As a first step towards saving time I strongly recommend a weekly timetable, setting apart certain days and hours for each particular household duty, based on the needs and requirements of each individual home. Nothing is a greater waste of time than to undertake household work haphazard or just when the spirit moves, as it throws the whole week's work into confusion, and we find ourselves in a sea of worries and difficulties out of which we are not extricated at the end of the week, and, consequently, we start the next week behind. If this system is allowed to continue, the life of that woman is worse than slavery. It is not necessary that I should particularize or go into detail to prove my statement, as you are all housekeepers, and I am sure that you will readily admit the truth of my contention.

My next point towards the saving of time is the proper division of labor. If there is more than one member in a household, that division should be based upon the ability, the likes and dislikes of the different members of the family. Certain work is more congenial to one person than to another, and this should be taken into account in the division of our household duties, as the work would be better and more quickly accomplished.

In families where there are children, they should have certain work appointed them. There are numerous little things about a house which a child can do as well as, or better than, the mother, and besides saving that mother's time, it is helping to give the child the necessary training in the care and management of a household.

To introduce my next point towards saving time to you, I will quote upon the old, well worn, though very applicable saying—"A place for everything and everything in its place." I am convinced that more time is wasted through a neglect of this wise rule than through any other cause. If we would train ourselves in the performance of our daily work, to carry out this principle, by having a convenient place for everything and returning things to their proper places after use, by training our children to have places for everything and to keep them there, by keeping our husband's apparel, etc., in a proper place, so that he can help himself without calling his wife to his assistance, and by our example and precept encouraging them in habits of order, we could save ourselves hours of labor and worry every week.

Now, I have just given a few general rules on the subject of time saving, leaving the details to be filled in by each one as you find they apply



to your individual experiences, and I am convinced that if these rules are carried out, no farmer's wife need have cause to complain of her position, her household would be governed in a systematic manner, her children would be trained in habits of order and industry, her husband would be contented and happy, and she would have time at her disposal to cultivate the higher qualities of the mind and heart which go so far towards adorning the character of our sex, and home would be what our Creator intended it—An Eden—A Paradise on Earth.

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## PHYSICAL CULTURE.

By MISS HOTSON, PARK HILL.

Physical development is a subject that has hitherto received very little attention. We have been ready to see the necessity of training the mind, but have left the body to care for itself, or if we have attempted to train it, we have done so with such indefinite ideas of what physical culture really is, that we have accomplished very little.

Most systems of physical training are incomplete in that they aim at muscular development only. Health should be the first aim; and the second, beauty, is included in the first, for beauty and health are inseparable. What produces one produces the other. Out-door sports, weights, clubs, dumb-bells, etc., are good in their place, but they are one-sided—they develop muscle, but strength of muscle is not always accompanied with health. The exercises indicated above do not proportionately increase the ability of the vital organs to supply the nourishment that is required to keep up those muscles.

The modern idea of physical development is to work the vital organs, to so strengthen and develop them first that they may be able to supply all the nourishment the body may demand. The first step towards this is accomplished by securing their proper position. Until this is done any exercise is likely to prove more harmful than good. When the chest is allowed to sink down the lungs are compressed and prevented from filling with air to their full capacity. Not only this, they press on the stomach and it in turn presses on the other organs near it, and so on, until all the organs in the body are forced down below their normal position and crowded together so that they have not room to do their work properly. Speaking of this, Dr. Emerson, Principal of the Emerson College of Oratory, Boston, says, "There is no physical defect so common as this—that the vital organs are from one to four inches too low among adults and among children down to five or six years of age. Before that age the vital organs are high."

We must, therefore, first of all, learn to stand correctly, that is with the weight poised lightly forward on to the balls of the feet, the chest high and well forward, and the head erect. At all times, whether standing or walking the weight should be on the balls of the feet. This position seems tiring at first, but once accustomed to it one can stand or walk much longer without fatigue.

With the vital organs in their normal position we should proceed to develop them by exercising the muscles that surround them. We must also establish such a relationship between the muscles of the vital organs and the muscles of the limbs, and also of the nerves that supply each, that while we are using one set of muscles and thus wasting energy we are at the same time stimulating the muscles which supply the nourishment to replace the energy that is being wasted.

Another important point is to secure perfect freedom of every joint and muscle that there may be no unnecessary friction, no waste of energy through using more muscles or more force than is actually required to accomplish what we wish.

Some people seem to walk with their hands as well as with their feet. They hold themselves on a chair instead of allowing the chair to hold them. They need to learn relaxation.

Again, nearly all the muscles act in groups and the different groups bear a certain relationship to each other. The muscles of the arm and neck, for instance, are so related that if you raise your arm the head is drawn to it. If you prevent the head moving you are using that much unnecessary energy. By doing away with friction and all this unnecessary waste of energy we gain greatly in endurance.

Many persons think that their daily work, housework, for example, gives them all the exercise they require and perhaps it would, if it exercised the whole body evenly, but it does not do this. Ten or fifteen minutes twice a day devoted persistently and intelligently to all-round physical culture, would, in a short time, make a surprising difference in their ability to do housework easily. It would give strength and endurance, for it would be refreshing no matter how tired one might be with other work, because it would exercise the unused muscles, relieve the tired ones, and equalize the circulation.

The system of physical culture that fills the requirements of every day life needs no special apparatus, only that the clothing must be loose and free. It consists of just a few carefully managed exercises, so planned that every part of the body, every organ, muscle and joint may receive its share of exercise daily. But these exercises must be repeated every day as regularly as you take your meals, for they are as necessary as food, and you cannot in a few years store up health for a life-time, any more than you could, in the same time, take sufficient food to last a life-time.

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## BEAUTY.

Being a report of an address given by Miss Braden, of the London Dermatological Institute, before the Ailsa Craig Women's Institute, April 14, 1905.

Opinions differ widely as to what constitutes beauty; there are so many types that no hard and fast rule can be laid down, by which to judge it. Every normal woman desires this gift of beauty, but it is given to but few. No woman is so beautiful that she can afford to neglect all aids, such as exquisite cleanliness, good grooming and becoming dress; no woman is so plain that she may not be improved by attention to these matters. A good figure and graceful carriage of the body go a long way to atone for lack of a pretty face. Habitual deep breathing along with daily practice and suitable gymnastic movements will help any figure.

The first requisite of beauty is health. To insure a good complexion the blood must be pure and the organs performing their various functions properly. Great stress must be laid on the daily bath, a sponge with tepid water and soap every morning and a hot tub bath once a week, at night, being excellent. Sleep in a well ventilated room, eat wholesome food, breathe deeply. The majority of women breathe with their chests only, instead of using the muscles of the diaphragm, as nature intended.



Cold soft water is best for bathing the face. Soap should not be used too freely. If one has been exposed to dust of any kind, the face should be cleaned with warm water and soap, well rinsed off with cold water. Let it be remembered, however, that the continued use of hot water and soap on the face will certainly result in a growth of superfluous hair, through time. The majority of so-called toilet soaps are objectionable. Imported white castile is always pure; if it be found too drying for certain skins, a brand called "4711" is recommended.

Wrinkles are a great foe to beauty, but if taken in time may be prevented. Massage with some good skin food is helpful, if intelligently administered. Wrinkles are caused by sleeping on too soft and too large pillows, and in positions that crease the face, by grimacing, by careless drying of the face after bathing, by mental or physical distress, and by worry. Facial blemishes, freckles, moles, liver spots, etc., may require treatment at the hands of a skilled dermatologist, but there are few cases which cannot be helped.

The hair, woman's "crown of glory," must also receive its due. It should be washed once a month or every six weeks at least. An excellent shampoo is made by dissolving castile soap in water until it is like honey. Mix two tablespoons of this with a beaten egg, have the hair wet, rub the mixture well into the scalp, rinse until the last water is clean, and dry it in the sun, if possible. The egg, if used with hard water, softens it, and is good for the hair anyway. Lemon juice in the final rinsing will keep fair hair from becoming dark. If gray or white hair is inclined to be yellowish, a final rinsing with water slightly blued with laundry blue will prevent it. The continued use of borax or ammonia will tend to turn the hair gray. A little vaseline rubbed into the scalp the night before washing the hair, is beneficial, if it be very dry, or if one has dandruff. The hair should be brushed regularly, but so that the bristles of the brush do not touch the scalp. A comb with coarse smooth teeth should be used; comb and brush must be kept very clean.

Cleanliness is also the chief point in caring for the teeth. They should be brushed several times daily, but especially at night. A dentifrice of approved manufacture should be used. One should pay a visit to the dentist every three months.

The thin woman who wishes to gain weight should rest as much as possible, ten hours in bed each night, and a nap of half an hour in the afternoon, is none too much. Take plenty of milk and raw eggs, breathe deeply. If practicable, a course of massage of the whole body will help. The woman who wishes to diminish her flesh should take plenty of exercise, eat a light breakfast, chiefly of fruit, avoiding butter, cream, and all flesh-producing foods, and sleep only seven hours.

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## HOME SCIENCE AND THE SCHOOL CURRICULUM.

BY MARY C. MACPHERSON, HAMILTON.

Among many objections which have been made in regard to the introduction of Home Science and its companion subject, Manual Training, into the common school curriculum, is the one referring to the isolation of the subject. Those who object to it on this ground claim that it should be learned at home, and that there is no connection between subjects ordinarily taught and "Cooking," for those who do object usually understand Domes-

tic Science to mean just that. The first part of this argument may be all right if facts only supported it. The home may be the place to learn it, and the mothers the very best teachers, but one has only to teach Domestic Science for a month or two to find out how few do learn the subject at home. The reasons are many and logical. In the first place, most of the house-keeping is done during the hours when the children are at school and they have few opportunities to get any training in the different branches of home-making. Again, in many families, time is at a premium. Mothers have too much to do to take time to teach the children how to do things. They can do it so much quicker themselves that they find it economizes time. If the idea of these objectors is to separate the home and the school they are going at it in the right way, and it remains for teachers of Domestic Science to remove from the minds of the pupils primarily—secondarily from the minds of the parents—the idea of the purely utilitarian value of Domestic Science, and obtain for it its true place in the curriculum, and have it become like the other subjects, a culture subject—not a bread-winning art.

After placing Home Science on the same basis as other culture subjects it remains to show how closely connected these really are or may be.

We find in the different grades of the public schools and high schools or collegiate institutes in which Domestic Science is usually taught, arithmetic, grammar, reading, spelling, history, geography, literature, physiology and, later, chemistry, physical science, biology, French, Latin, etc.

Beginning with the first of these, Arithmetic. In a laboratory where individual work is the order we have recipes which must be divided to suit the equipment. A full recipe is given and each pupil is required to make one-eighth of it. When quantities such as  $3\frac{1}{2}$  teaspoons,  $2\frac{1}{4}$  cups, etc., are called for we have at once several questions in mental arithmetic, and as the easiest way to measure parts of a cup is to use a tablespoon (16 to a cup) we have still another problem. Again we find practical use made of the tables of measurement which have previously been learned by heart and used to solve problems from text books. Here these tables of measurement are not dictated to the pupil, but are discovered by actual experiment by each pupil. These are examples of questions which are constantly coming up in a way which is practical and therefore far more important to any child than when they are merely concerned with a question of dividing so many apples between John and Mary on the blackboard. It accomplishes one of the aims of arithmetic particularly well by teaching accuracy, for accuracy is an absolute necessity in cooking, and a lack of it brings never-failing bad results, an observance of it, complete success.

The value of Domestic Science as a help to Arithmetic and of Arithmetic as an aid to Domestic Science is obvious when we come to consider marketing and cost of materials, which is one branch of the subject.

When we think of such subjects as Reading, Spelling, Dictation, English Grammar, we find that we have in our class in Domestic Science an indirect but none the less important co-relation. New words are added to the vocabulary when the child is at a particularly susceptible age and very observant. These words are not isolated, but are used in their proper connection and hence are more impressive.

Perhaps where we find the closest bond with other school studies is when we come to consider the special sciences. In the public school we have Physiology, Temperance and Hygiene. At present the pupils learn it from text books as any other subject. With the introduction of Domestic Science we find Physiology made more intimate to the child. It becomes a personal question—How food is to supply the elements required for building up the



body. The child is taught to regard the body from the standpoint of a machine which has various parts from each of which certain work is demanded and which receive the energy necessary for this work from food and air. There is no longer the same chance of pupils learning by rote the names of "the bones of the lower extremities" and not knowing where they were at when asked to name "the bones of the legs," as has actually occurred. Domestic Science provides a purpose in learning these things and makes the object not to learn enough tests to pass an examination, but to become familiar with the body and its requirements with the purpose of providing proper food properly prepared.

Other science subjects, Chemistry, Biology, Botany, Physical Science, etc., can both help and receive help from the class work in Domestic Science. With the work of beginning classes in Domestic Science in the public schools many points bearing on these subjects are introduced unobtrusively, and their value is determined later on when the course in these subjects is begun. With older classes the facts dealt with in the chemical and physical laboratory are utilized in the processes involving chemical changes which are so numerous in the Domestic Science laboratory. For example, we have the question of temperature. With small children the first lesson in which the thermometer is used is usually very interesting, and there is excellent opportunity to explain very simply its construction and to give practice in its use while introducing at the same time a little philology which impresses the use of the instrument on the child—the work being derived from the Greek *thermos*, heat; *metron*, a measure. Then we have also the consideration of water chemically—its purity or impurity and consequent necessary treatment considered and discussed in terms which are not so technical. Physiologically we consider water as a source of disease, and from this deduce the care of water and of its source to prevent infection.

Again, in considering the many changes which take place under the influence of combination of heat in the processes of cooking and other house work, we have our connection with Chemistry. For example, we have to study the preparation of soda and cream of tartar; the action of these in the presence of moisture; the effect of heat on baking powder; the growth of yeasts; the formation of gas in all these processes, and the other resulting chemical elements or combinations. In fact at every turn we meet with some physical or chemical changes under the processes which either recall something already learned or gives new knowledge which is of use in the chemical laboratory.

Biology and Botany have an obvious connection with Home Science. Before we can understand the proper treatment of foods derived from the animal or vegetable kingdom we must first know their composition and construction. In studying the composition and construction of foods of the animal kingdom we find our connection with Biology; with Botany, in studying the foods of the vegetable kingdom from the same standpoints. And here also we have a close relationship shown between Biology and Botany, or animal or vegetable growth, introducing the interesting question of Nature's Food Cycle and the theory of the Conservation of Energy. How vegetable life, making use of chemical elements and substances which are of no use to animal growth, prepared food in a form which can be used by the animal kingdom, and how in the life process the animal breaks up the more complex material into the simple elements for the use of the plant again. The study of germ life can also be introduced in considering the work of bacteria in decomposing animal waste to prepare it for consumption by plants.

With Geography and History we are closely connected in studying the source of different foods—their introduction into different countries as articles

of commerce and mediums of exchanges. In connection with the transportation and production of these foods may be studied various manufacturing industries; the preparation of canned goods, meats, vegetables, etc.; certain patent foods, Force; Shredded Wheat, and its delightfully clean preparation in the Oread building at Niagara Falls, N.Y.; fruits, dried or canned; flours; baking powders, etc., and the adulterants frequently used and to be avoided. All this making both subjects of more vital interest, and therefore more easily comprehended by the pupil.

Even Literature, French and Latin, which would seem to be most distant from our subject, are readily and unobtrusively introduced. First a few words are taught to smaller children before the class has studied foreign languages. French is used very often on elaborate menus, and many words are used even in plain cooking. We have a free use of such words as menu, *rechauffée*, *purée*, *entree*, *consomme*, *bouillon*, *fricassée*, etc., and as these are always used in their proper connection, no misunderstanding as to their meaning can arise, and unconsciously the children are beginning to acquire a vocabulary in foreign languages, which is one of the most necessary parts of the study of these. From other various languages we derive other words; *macaroni*, *koumiss*, *vermicelli*, *sauerkraut*, etc.

In describing the object of the classes in Domestic Science and to show the class that it is not a narrow subject confined to one part of the work of one room in the house, one of the best ways is to show the true meaning of the name of the subject and give them the translated Latin, *Domus*, the home; *Scuo*, I know—to “know home”—the word home always meaning rather the inner life of the inmates of the house than the care of it. Thus is accomplished at once something towards the elimination of the narrow and confined comprehension of the work of Domestic Science or Home Science and the introduction of a Latin phrase into the vocabulary. We have in the methods of cooking a process known as *Sautéing*—and the method is constantly confused with what has been and is usually called *Frying*. There is some difficulty in getting a class to discriminate between these two methods, but as a great help we have the simple translation of the word from the French in the first place,—from the verb “*sauter*” to jump or leap—and with classes who are reading French authors by reference to one of the books on the curriculum at present where in a description of the preparation of a meal we find our word in its double meaning—“*Les pommes de terre sautaient dans la friture crepitant*,” and the illustration accompanying it shows what is meant.

English Literature also has its co-relation. We have a certain chemical change in milk under heat which causes the formation of a wrinkled skin on the surface. This is used as a sign by which to tell when milk is scalded. This test has been given to the class several times and still escaped them until one day the lines from Oliver Wendell Holmes came into my mind in connection with it, and from that time they always remember it.

“My wife shall dress in finest silk,  
Like wrinkled skin on scalded milk.”

And in reading the poem they have a finer appreciation of the poet's meaning. Then in the warm summer months when it is hard to keep the attention of the class fixed, a few moments spent in describing Longfellow's story of the discovery of Indian corn or maize is not wasted. Not only are they introduced to a beautiful legend, as found in *Hiawatha*, but they acquire the knowledge which some pupils actually do not possess, that corn-meal is not derived from corn, and that Indian corn and maize are the same.



These are only examples of literary references which may be made if one is on the alert, but the fact that we can do so is a very important item in preventing the spirit of utilitarianism from creeping into the work. As long as the subject has to be made "popular" and the class is an option, there are many hindrances to the introduction of too much, or even enough theory, and as long as the idea exists that the girls go to the classes to learn to cook, we must resort to every device to make our work interesting, and unobtrusively make the necessary connection with the other subjects. Fortunately we are come to a time when all the larger towns and cities have either opened or are opening classes, when the subject is taught to the teachers in training as a necessary part of their preparation for life as teachers, and when there is less and less objection to it as a fad and more acceptance of it as an integral part of the school work.

Before leaving this subject, with which I can deal only briefly, it would seem to clinch the argument were I only to mention what many of you have already learned from a very interesting paper of Dr. McLellan's on the "Conservative Activities," that most of the studies on the curriculum have arisen out of the necessities of these constructive activities. Primitive man dealt only with the question of "what shall we eat, or what shall we drink, and where withal shall we be clothed?"

Out of these wants of man arose the need for agriculture, and out of agriculture arose the necessity for tools with which to till the ground and with which to prepare the products of cultivation into food and raiment. As civilization developed and the population increased, some necessity for division of the country arose and out of this necessity came arithmetic. As travel became wider, commerce began, and we have geography, etc. The traditions of the people and a record of their growth were set down, and we have literature and history resulting. From these main heads spring all other subjects and they grow and develop with the needs of the people.

Domestic Science is essentially a constructive activity and it is one of the bases of the other subjects surely that proves conclusively that there is a very intimate co-relation which cannot be evaded.

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## DOMESTIC SCIENCE.

BY MISS JENNIE FILSON.

In this progressive and wide-awake world of ours, the cry is for specialists in everything. Work is becoming more and more specialized every day, and women should bear this in mind, and by study and observation seek to bring themselves up-to-date.

Less than a quarter of a century ago, Domestic Science conveyed no meaning to the Canadian feminine mind; to-day it suggests, though vaguely to most of us, the idea of superior cooking and sanitation. Then, a training in home duties was unknown and girls were supposed to attain such knowledge by instinct. Even now some girls are allowed to grow up without even knowing how to boil a potato or how to manipulate a needle. This should not be, for home-making is woman's sphere, and what is more important than being able to cook food in a dainty manner for the family, and what has a better effect in making them feel happy, comfortable and healthy? Every mother should strive to train her daughters to be good housekeepers.

You might ask how can Domestic Science help in the training. It can answer such questions as: How can a house be heated, lighted and ventilated hygienically? How can the body be kept in the finest and healthiest condition at the smallest expense? What is the best thing to do in case of sudden accidents? Why should vegetables be boiled quickly, meat slowly, and tea not at all, etc.?

The utilitarian value of this study to the individual girl lies in the fact that it gives her the best preparation for what, in all probability, is to be her life-work. With a thorough knowledge of its principles no one would be at a loss when confronted by new conditions and environment. I think that girls would like housekeeping better if it were always placed on a scientific basis. And women who are no longer young could manage their homes in a more easy, and perhaps more economical manner, if they spent a little time in the study of this subject.

We have read and heard quite a number of splendid papers treating of this science in its many phases. Our President requested me to tell something about cooking, as we were taught at Normal. Ruskin says, "Good cookery means the knowledge of all fruits, herbs, balms, and spices, and of all that is healing and sweet in fields and groves, and savory in meats. It means carefulness and inventiveness, watchfulness, willingness and readiness of appliance. It means the economy of your great grandmothers and the science of modern chemists. It means much tasting and no wasting—English thoroughness, French art, and Arabian hospitality." It means, in fine, you are to be perfectly and always ladies (loaf givers); and as you are to see that everybody has something nice to put on, so you are to see that everybody has something nice to eat.

The function of food is to provide growth and energy, and it is divided into three classes, viz.: (1) The proteids, such as milk, eggs, meat, etc., which build up the tissues. (2) The carbo-hydrates or heat producers, such as starch and sugar. (3) The mineral foods, such as salt, sulphur, iron, which build up hair, nails, etc., and some aid in keeping the blood pure.

Eggs are a typical food because they are almost all albumen and of the purest kind. Milk is a perfect food because it contains all the five elements necessary for life. Care must be taken to keep milk in a clean place as it very readily absorbs odors and impurities. To pasteurize milk, heat to 180 degrees, cool, and heat it again. This is done three times. Meat is composed of three nitrogenous compounds—albumen, gelatine, and extractives. Albumen is of the highest importance; gelatine is tissue saving, but because of its slippery nature is not valuable as a food when taken by itself, slipping through the body without exciting the flow of the digestive juices; and the extractives give the meat its taste and make it stimulating. To choose good beef one must see that it is purplish red when first cut and when standing it should be a brighter red with a moist surface, elastic but not sticky. The muscles should be well marbled with fat and the fat a light creamy color. Beef with short fibre is tender; long fibre, tough. Short fibred meat should be cooked in its own juices and that of long fibre in water. In choosing veal, get that which is pinkish white. If too pale, it denotes that it is too immature (less than six weeks old), or that it has been bled too much. Pork should be very well cooked, because it is more apt to contain germs of disease. The meat should be pinkish white and the fat white and firm.

Soup-making was next taught and we learned that soup could be made out of almost anything from bones to artichokes.



A normal diet must consist of all the different classes of foods. A person limited to proteid food, such as lean meat, would have to take more in nitrogen than is needed to supply sufficient carbon. On the other hand, on a diet of rice, you would have to eat enormously in order to get enough proteid and fat. The quantity and proportion of food needed varies with age, climate, habits of life and other conditions. It has been calculated, that a normal diet in this country would be as follows:—for one day—proteids, 3.5 oz.; carbo-hydrates, 17.5 oz.; mineral salts, 1 oz.; water, 100 oz. (6 pints); and fats, 1.7 oz.

This being such a wide subject, there is only room in this paper for a few thoughts. Science is systematic knowledge; therefore household science is knowledge of everything pertaining to the household.

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## THE EDUCATION OF OUR DAUGHTERS.

BY MRS. D. MCTAVISH, NORTH BRUCE.

We hear a great deal now about Higher Education for women, and it would only be proper to enquire what that means. If it is an education which is to fit our daughters better for conducting and caring for the home, then it is higher in the truest sense. Woman's proper sphere is to be the home-maker, and it can scarcely be called a home unless there is a woman presiding there. There everything that helps to fit her for occupying that responsible position, with credit to herself, and with the greatest degree of comfort to the members of that home is an essential part of her education. Even in the Garden of Eden, before sin entered the world, man could not get along alone, and it was found necessary for his comfort that he have a companion to cheer and care for him. Then how much more necessary is it now, for since that time the cares and duties of home have been multiplied a hundred fold.

Since, then, the home and the care of it is woman's proper sphere, it is right and necessary that she should be fitted by education for doing so in the best possible manner. If our sons choose a trade or a profession, their teaching and training is all in that direction; and we cannot expect that our daughters will be competent to undertake these grave responsibilities without being properly trained for it. We make the highest and cleverest of our girls school-teachers, typewriters, and book-keepers, and if there is one not so bright and clever as the others, we think that she will be able to care for the home. But that is where we make our greatest mistake; for all these things put together do not require the same amount of care and forethought which the position of housekeeper requires. That is where we want the co-operation of "the head, the hands, and the heart," planning and working in unison in order to be able to "guide, to counsel and command."

Prizes were offered about three years ago, in the *Farming World*, for the best answers to the question, "What education should a girl receive who expects to be the successful helpmate of an up-to-date farmer?" and some very good answers were given. They had to be put in very concise form, as they were not to contain more than a hundred words.

One of the first things mentioned as being necessary was a liberal education. This, of course, means a thorough training in all the different branches, and should be such as to develop the thinking and reasoning

powers, and a taste for good reading. It should also render her competent to keep her household accounts. Let her have music, also, as that is one of the things which cheers and brightens the home.

She should also be taught to take proper care of her health, and for that purpose she should take exercise, to develop her muscles and make her strong. I believe some girls are allowed to fall into poor health by neglecting this, not being enough in the open air. One of the best exercises for this is walking.

She should also have a thorough training in the principles of domestic economy, including sanitation and ventilation, and the hygienic values of food, fuel, and clothing. A course at the Macdonald Institute, even if it is only a short one, will be found valuable for those who wish to fit themselves properly for this work.

She will also require a thorough knowledge of dairying, and everything connected with it; to understand the proper care of milk, its value as food, and how to make a first-class article of butter. It is all right and proper to have accomplishments, but I consider that the girl who can make good bread and butter does more for the comfort of the home than the most skilled musician.

She should also be a good plain cook; one who understands what a balanced ration is, and what food the system requires under different conditions and temperatures. Not so much fancy cooking, but how to cook meat and vegetables that they may be rendered most nutritious, and at the same time appetizing. In one of the answers to the question I have mentioned some one said that a farmer's wife should know how to make cake; some one commenting on this answer said, "An up-to-date farmer does not require a wife to bake cake." Now I beg to differ from this; I think a farmer's wife, as well as any other man's wife, requires that knowledge, and although I do not approve of it as a daily article of diet, I think that she ought to know not only how to make it, but also when to use it. I think, however, that too much attention is paid to fancy cooking, and not enough to the serving of good plain meals which are so much better for both our stomachs and our tempers.

Then the girl who expects to fill that position should be good with the needle, and should know how to cut and fashion dresses and other articles of clothing for herself and the other members of the household. It will not do to have to run to the dressmaker for everything; it takes a big purse to do that, and the young farmer has to economize, if he wishes to succeed. Learn to dress plainly and neatly, and to select suitable material for the different articles, avoiding everything tawdry or flashy. We can dress our families tastefully and neatly without having them in frills and lace, and they will enjoy themselves more.

There is also a knowledge of home nursing required, for, alas, our families are not always in health, and we should learn to use simple remedies for accidents and emergencies; for sometimes we are a long way from a doctor, and life may depend on some prompt measure at the time. Along with this I would mention the care and training of children; to see that they are properly fed and clothed in order, to develop healthy bodies and sound minds, for there is a great connection between the mind and the body. To see that they have abundance of pure air and sunshine, that their bodies are kept clean by means of the bath, in order that the pores of the skin may be kept open, and in proper order for throwing off the effete matter, and that their clothing be such as is fitted for the comfort and protection of the body, and not for display.



Her education would not be complete without a knowledge of gardening and poultry raising, for on the farm both of these have generally to be done by the farmer's wife.

A girl should also be taught the value of money, and how to expend it to the best advantage. The husband is the wage-earner, but it is generally the wife who is financier for the household, and she should try to do her part in spending it judiciously and to keep a strict account of it, and see that none of it is wasted.

Some may think that my list of requirements is long, but we could scarcely get along with a lack of any one of the different things I have mentioned as necessary. We must teach our daughters that it takes more than a pretty face and a nice dress to fit them for presiding over a home.

I remember hearing a simple ditty, which often recurs to my mind, and which helps to illustrate what I have said. It was about a young man who was on the look-out for a wife, and there were two sisters in a home where he visited. One of them was generally busy with the household affairs, helping her mother, while the other seemed to have more leisure and inclination to entertain visitors, and so she won the day. But he had drawn the blank instead of the prize. It ended with these verses:—

“Ten years after well he knew it,  
Knew that he had chosen wrong;  
Knew a dainty home and dinner  
Were far better than a song.  
Knew that white hands may be pretty,  
For a lover to caress;  
But the hands well trained to labor  
Are the hands that truly bless.”

See to it then, girls, that your hands are the hands that truly bless—the hands that know how to minister to the wants and comfort of those depending upon you; and they will not only bless others, but they will be a blessing to yourselves; and you will not only be a successful helpmate, but an inspiration and a blessing to one who will win you for a wife.

“She will do him good, and not evil, all the days of her life.”

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## THE MODEL SICK ROOM AND REQUIREMENTS.

BY ELLEN CARTER.

The comfort and well being of the invalid depend to so great an extent upon his surroundings that, in consideration of the universal liability to illness and accidents, there should be in every well arranged home, an apartment chosen and specially fitted for the use of the sick. But the matter, in spite of its importance, is so generally ignored that it is very rarely that the nurse will have the good fortune to find any provision made for such contingency. You will be called upon to nurse in all sorts of places, and often under the worst possible sanitary conditions.

It is important to have a clear idēa of what the sick room ought to be, in order to choose the least among unavoidable evils, and how best to utilize such advantages as you may chance to secure.

A model sick room is spacious, light, airy, clean and quiet. The larger the room the better it can be aired, the more airy it is the cleaner it will be, and the cleaner it is the more favorable is it for the recovery of the

patient. This is, therefore, an important consideration from a hygienic point of view. The sick room should be located on the sunny side of the house, having a south or west aspect. Only in exceptional cases, such as inflammation of the eye or brain, is it necessary to have the room darkened, and even then a south room with the light carefully modulated by blinds and curtains is to be preferred to a darker one on the north side. Light is a healthful stimulus, and in the majority of cases not only light but direct sunshine is to be desired, partly for the additional cheerfulness which it imparts, but still more because of its actual physical effects. The Italians have a proverb, "where the sun does not enter the Doctor does," showing their recognition of it as a powerful agent. Also let us look at the effect the sun has upon the lower animals. The depressing effect of a week or two of cloudy weather is felt in the whole animal world. Cattle go moping about, the birds refuse to sing, the crows fly about giving voice to their discomfort; in fact everything, both great and small, shows the effect of cloudy gloomy days; but let a day of sunshine come, and behold the change; people meet each other with happy smiling faces, horses toss their heads and caper away, playful birds sing as though it was the first day of creation, insects hum, and all nature is joyful. If the lower class of animals feel its effects, how much more the higher class; and why is it so many of us shut it out of our houses; is it healthful or wise? Have as many windows as possible, certainly no less than two. They should be such as can be opened at both top and bottom, and should reach nearly to the floor, that the patient may easily see out of them. Bars and streaks of light are to be guarded against, as they may occasion a great deal of annoyance.

The sick room should be as far remote as possible from the noises and odors of the house and street. It should be solidly built, having walls thick enough to deaden external noises, and floors substantial enough not to vibrate under every tread. When this is not the case, manage, if possible, to have the room above unoccupied. There are numerous advantages to be gained, especially in cities, by having the sick room at the top of the house. It will be more quiet, in a stratum of purer air, and, in case of contagious diseases, can be more completely isolated. On no account should there be stationary basins in the sick room itself. If you find there are such modern conveniences, cork up the overflow holes, or stop them with plaster paris, and fill the basin with water which must be changed from time to time, or cover it entirely and closely.

The increased security will more than compensate for the extra trouble. Only with the utmost precaution against leaky and defective taps, are drainage pipes to be allowed even in the adjoining dressing room. The latter is an important adjunct to the sick-room. In it are to be kept the bath and toilet appurtenances. Ample closet room is also desirable, with shelves and drawers for the reception of linen, and of the various medical and surgical appliances which may be needed, but which should never be visible in the sick room. It is a common but very reprehensible practice to have food, medicine and all sorts of paraphernalia lying about, in a confusion that would be enough to make a well person sick. They should all be banished except at the moment of actual use. Growing plants and freshly cut flowers of not too strong odor may fill their places, if desired. They are quite unobjectionable. The water in which flowers are kept must be daily changed, and the flowers themselves thrown away as soon as they begin to fade. Do everything possible to make the sick room the brightest and cheeriest in the house. A certain amount of depression is the inevitable accompaniment of sickness. It cannot be entirely dispelled, but all counter-



acting influences should be resorted to. Dark, gloomy, and unpleasantly suggestive surroundings do much to intensify it.

The walls and ceilings are best of some soft, uniform neutral tint, as pale green or French gray. Avoid wall papers of conspicuous tone or regularly recurrent figures. Better than any paper, is paint, or a hard finished surface which can be scrubbed. The wood work should be severely plain and flat. There should be no cornice or mouldings, and no woollen curtains, portieres or drapery of any kind. All woollen stuffs easily become infected, and are extremely difficult to disinfect. If any curtains are used, they should be of light washable and frequently washed material. Carpets even are much better dispensed with. Rugs may be used, as footsteps are noisy on a bare floor, but they must be small enough to be daily removed, shaken and aired. If there is a carpet it can only be thoroughly swept and cleaned when the patient can be got out of the room.

The essential furnishings of the sick room are,—bed, a bedside table, an easy chair, a lounge, and a large moveable screen. The latter can be readily improvised by fastening a sheet over an ordinary clothes horse. A bed tray with a low rim round three sides may be used by the patient for all the purposes of a table. These trays are about thirty inches long by fourteen broad, and stand on four legs high enough to keep all the weight off the body. A bed rest, a commode and similar small conveniences may be desirable, but the fewer superfluous things the better. All the furniture should be of the simplest possible style; elaborate carvings only afford lodging places for dust, and whatever adds to the difficulty of maintaining absolute cleanliness is to be avoided. Everything should be substantial and in good repair. Ill-fitting blinds, rattling windows, and creaking doors, are nuisances demanding speedy remedy. Many slight and apparently unimportant noises, which are, nevertheless, peculiarly annoying to the sensitive nerves of the sick, may easily, with a little care and forethought, be done away with. Keep rocking chairs out of the room. Avoid wearing clothes that rustle, or shoes that squeak. Noise which is understood and inevitable is far less trying than a much slighter noise unexplained or unnecessary. Intermittent is more hurtful than continuous noise. Sudden, sharp, and jarring sounds are especially bad. A good nurse never startles her patient; even in such a small matter as her way of addressing him, but is considerate of his weakness. Do not speak abruptly from behind him, making him first jump, then turn round, then ask what you said; get his attention before speaking and use a clear, distinct, though not necessarily loud voice. Whispering in or just outside the door is one of the worst of many distressing forms in which the solicitude of the patient's friends will manifest itself. There are few things more tormenting, though it is usually done with the very best intention of not disturbing him. A low distinct tone, when conversation is necessary, will seldom annoy. Whispering always will. It should be a rule that whatever the patient is not intended to hear should not be said in his presence.

These seem very small points to dilate upon, but good nursing depends largely upon attention to details so apparently trivial that a careless person would never think of them, but which yet make or mar the comfort of the invalid. Small things assume momentous proportions in the limited interests of a sick room. Nothing is insignificant or beneath notice which has any bearing upon the welfare of the patient. To keep the sick room in a proper condition is as important a part of your care for him as more personal administration. A nurse ought not to be expected to do housework which can be equally well done by someone else.

The work of a nurse in a private family varies so much with circumstances, that its limits cannot be precisely defined. But with all due regard for your professional dignity, surely you will rather perform the most disagreeable and commonplace tasks than let them go undone to the detriment of your patient.

You must be prepared to encounter many inconveniences, your ingenuity as well as your patience will often be taxed, and sometimes you will find yourself looked upon as a kind of machine, expected to run night and day without even needing to be wound up. In a hospital there are no difficulties of this kind, as everything is planned with reference to the needs of the sick. The most convenient appliances are at hand as a matter of course, the duties of each person are definitely assigned, and the work, as much as possible, simplified by systematic arrangements and regular hours.

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## HINTS ON HOME NURSING.

BY MISS ANNIE DICK, BRAMPTON.

(Graduate Toronto General Training School for Nurses.)

As this paper is to be composed of hints only, the difficulty is to make them to the point and broad enough to be understood, else they will be of no value.

Let me begin by advising every woman who has not a thermometer in her home to invest in one on the first opportunity and study a few things about temperature. This would save hours of worry and anxiety to many. Don't let anyone prevent you from buying one, with the advice that the less you know about these things the better. Anyone who gives such advice is as stupid as the ostrich which hides its head in the sand and thinks because it refuses to look at danger it will escape!

Many times a person, especially a child, whose temperature has risen, and who complains of sickness, if put to bed, kept on light diet, and given generous doses of medicine until the bowels move freely, may escape a severe illness.

But when severe illness does come and you wish to nurse the patient as carefully as possible, begin by making her comfortable—the comfort of the patient is a rule which must never be lost sight of, if you would do good nursing—remove all unnecessary bed clothing; the clothing should be as light as possible. In the hospitals, each bed has a rubber half sheet under the cotton sheet, pinned at each corner to the mattress with safety pins. In private homes, a cotton quilt under the sheet is sometimes used, or simply a cotton sheet folded once and placed over the usual sheet. In an emergency, half a dozen newspapers placed under a sheet will protect the mattress—but whatever is used must be kept perfectly smooth under the patient. Loose, wrinkled bed clothing is very uncomfortable to lie on, and is one of the things that help to make bed-sores.

Bed-sores are something you should begin at once to guard against, and remember it is easier to prevent bed-sores than cure them. Cleanliness is one preventative; dry smooth bed clothing, another; turning the patient occasionally, another; (turning is also necessary to help circulation and guard against pneumonia) rubbing the back and other sensitive parts, morn-



ing and evening, another preventative. We use a little alcohol or whiskey in the palm of the hand when rubbing, as this helps to harden the skin; but remember it is the rubbing which prevents the bed-sores. Rub firmly and gently until all redness has left the skin. A little powder dusted on afterwards will absorb any moisture. If the skin once breaks don't rub that part or put any spirits on it. That requires other treatment which I cannot explain in these notes. Your doctor will tell you what to do.

The care of the mouth is another very important item in sickness, that also should have attention from the first. Have some member of the family cut up old linen or soft cotton into pieces about three inches square. A pasteboard box filled with these should be kept in the sick room ready for use. There are many mouth washes we might give, but the one I like best, and which as a rule the patients seem to prefer, is a mixture of lemon juice, glycerine and water, of equal parts. Have the mixture made up in a bottle, pour a little in a small dish, dip one of the cloths into it, gently squeeze the cloth, then wrap it around the index finger, tell the patient to open her lips and shut her teeth, rub around inside the teeth; put this cloth away, take a fresh one and do inside the teeth; another cloth or two finishes the tongue. A small dish or a paper should be at hand to receive the soiled cloths, which should be burned at once. And remember that a sore mouth, like a sore back, is much more easily prevented than cured.

Perhaps it would not be out of place to mention here that we are taught to wash the babe's mouth from the first day of birth, in the same way, only, of course, not using this mixture, and being careful that the pieces of linen or muslin are soft. Simple warm water or borax water does for the wash. The child's mouth should be washed three times a day. Thrush is caused by neglect of this, particles of milk collecting around the gums, where they decompose and set up fermentation.

To go back to the patient; if a woman, keep her hair braided in two braids. You can then comb one-half from either side of the bed. That saves the patient from all exertion, except the slight one of turning her head.

If ice-cloths are used on the head, use only one ply of cloth and change frequently. If several plies are put on, it will produce the opposite effect to that which an ice-cloth is supposed to produce.

Keep the patient's feet always warm. If you haven't a rubber bottle, fill gem-jars with hot water, and, after testing them to see that they do not leak, wrap flannel around them, taking care that you do not burn the patient.

Give nourishment and medicine always on time, not twenty minutes before or after the hour. Don't be afraid to give water to drink. Patients should have all they want and some patients should be persuaded to drink more than they wish (this, of course, cannot be followed when the doctor leaves us orders limiting the amount of liquid). Some doctors order typhoids to drink a pint, or a pint and a half, every twenty-four hours. Water taken internally or applied externally helps to reduce temperature.

There is all the difference in the world between sponging a patient to reduce temperature and bathing a patient for cleanliness. Before beginning to either bathe or sponge see that you have everything you will require at the bedside before you disturb the patient; have two pieces of old blanket, one to put under the patient to protect the bed, and one for covering. To bathe, rub quickly under cover of the blanket with tepid water and dry thoroughly with towel. This is for a weak patient with no elevation of

temperature. For sponging, either the piece of blanket or the cotton sheet will do for covering. Sponging is done with long slow strokes, first one part of the body, then another. For instance, let the patient place her hand in yours and tell her to relax her arm, you must support the arm, not she. Then squeeze the sponge, so that it will not drip. Begin at the top of the arm, bring it down slowly in one long stroke to the tips of the fingers. Go around the arm in this way, dipping the sponge after each stroke. Five minutes for each limb and breast, with ten minutes for the back are not too much for high temperature. The water may be used from cold to iced, according to the temperature, comfort of patient, or doctor's order. A light dab with a towel is sufficient for drying; the water will quickly absorb on the hot skin. Finish the sponging as quickly as possible. Generally the patient, if not disturbed, will fall asleep after a sponge, and there is nothing like natural sleep to reduce temperature. Change the patient's gown and bed linen every day. If they cannot be washed each day, let them hang out in the sunshine to air.

Diseases are divided into two classes, acute and chronic. We all know that, as a rule, chronic patients are pleased to see visitors and like to be amused, but, unfortunately, people do not seem to understand that persons acutely sick are sacrificing so many chances of living with every visitor they see.

Don't worry a patient asking questions, for anyone very sick talking is hard work; and don't ask her what she would like to eat. If she knows she'll soon tell you, otherwise you must do the thinking.

Don't whisper in a sick room unless you wish to torture every nerve in the patient's body. This may seem very insignificant advice, but worth your attention. Let me tell you what I heard a woman tell some years ago. I have never forgotten it, so much did it horrify me at the time. Mrs. A.—was telling of the illness and death of one very dear to her. "Yes," said Mrs. A——, "It is just two years since Mary died, and how well I remember the day before she died. Mrs. B—— and I were sitting in the room talking in a low tone which we thought Mary couldn't hear, and I remarked that it would be just a year to-morrow since Jenny died. We were so surprised when Mary spoke up and said, 'Yes, just a year to-morrow since Jenny died, and to-morrow I'll be with her'." Think of it, Mary lying weak and nervous, hearing two people whispering about recent deaths and knowing that her own was being contemplated. Is it any wonder she died the next day? And yet the woman who did this, and told it, was a loving and kind woman with no thought of being cruel. Everyone of us has been just as cruel, each in her own way, and it all arises from lack of knowledge.

Just one more don't—don't darken a sick room; open the shutters, push up the blind, and let in every ray of sunshine that is to be had. If the air outside is hot, keep damp sheets before the window. One writer says, "It is often a source of wonder why so many describe in minute detail the treatment intended for a patient and say not a word about these important aids, fresh air and sunshine." If the doctor handed you a tonic with one hand, telling you to give the patient a teaspoonful of it, and, with the other hand poison, to be given at the same time, you would think him insane, and yet that is just what you are doing when you work with one hand to save the patient's life, and with the other darken the room. Time will not allow me to touch on the care of contagious or any particular disease, and many more hints could be given on general nursing, but we believe that a few, strictly observed, will be of more value than the knowledge of many not carried out.



## CONSUMPTION: ITS PREVENTION AND HOME TREATMENT.

BY MISS ISOBEL RIFE, HESPELER.

In view of the fact that scientific investigation and discovery is constantly enlightening us, we may but keep abreast of to-day, knowing that the morrow will bring greater revelation. The spirit of investigation which is rife is bound to confirm or refute our ideas, and he who is wise will strive—particularly in the subject under discussion—to keep himself posted. Eminent physicians are spending the best of their energies to arrive at the truth, and it is our duty to accept and live in accordance with their efforts on our behalf. Nature alone is constant and we suffer as a result of the violation of her laws.

The word consumption means to consume, to bring to naught, to waste away. It is aptly termed "The Great White Plague," because it comes with such insidious and silent tread that its footfalls are unheard. It may affect almost any part of the body, but we shall confine ourselves to what is termed "Tuberculosis of the Lungs." Each year this form of the disease sweeps off more victims than all other contagious diseases combined. If smallpox or diphtheria invade our locality we take every precaution, but we pay little attention to this plague because "It is not in our family." Let us beware, for no class or kind is secure from its ravages. At one time leprosy was prevalent; to-day we rarely hear of it. So it may be with consumption, which, taken in time, is curable, and under proper conditions is preventable. Many people when diseased lose heart and so allow the lamp of life to burn out for want of trimming. Previous to the establishment of sanitoriums, consumption was on the increase but, thanks to those institutions, and the observance of better sanitary laws, it has, during a period of four years (ending 1904) decreased forty per cent. in spite of an increase in population.

Douglas Powell says:—"Consumption is essentially a scourge of what we term Civilization." By this he does not mean the blessings of civilization, but rather its attendant curses—intemperance in anything, bad sanitary environment, irregularity of living, and other evils. Indian and Nomadic tribes in their wild state rarely suffer from tuberculosis, but on being brought into civilization, where they still retain their filthy habits in badly ventilated houses, with little pure air to offset disease, they rapidly succumb to its ravages. Statistics prove, "The denser the population, the higher the death rate," while the prevalence of tuberculosis in river and industrial districts point to social rather than climatic causes. Ignorance of the nature of the disease, of protective measures, of the fundamental laws of health, is unnecessary in this enlightened age, and neglect may be designated crime.

Heredity does not play such an important part as was formerly supposed. Statistics of the world prove that there have been known cases, but these are so rare as to warrant one in stating that tuberculosis is NOT inherited. On the other hand, predisposition, or a certain constitution of the tissues which furnish a suitable soil for the settlement and growth of bacilli or germs is frequently communicated. Any characteristic, particularly if it be of the nature of a taint or deterioration common to both parents, is liable to be intensified in the children. A flat chest, slender body, general lack of vigor or any other hereditary taint should be a warning to use every precaution for prevention. Our family physician tells me that if he were in the insurance business and bound to pay the risks out of his own pocket he would prefer to insure a child of consumptive parents, which had been removed from its home at birth and reared in sanitary surroundings, rather

than a strong, healthy person, with no predisposition to the disease, but who was living in the home of a consumptive.

Koch's theory, "Without the germs of consumption there can be no consumption" is now countenanced by the greatest authorities. There are two things necessary for harvest: the poisonous tubercle bacillus, infection, seed or germ, and the suitable receptive, non-resisting soil, commonly termed predisposition. Disease germs surround us on every hand. When they enter the body they are met by a sort of standing army of blood cells which promptly oppose their entrance. It is this protective antidotal force in the blood which saves us from disease. The germ is a minute vegetable organism which lives on and destroys tissue besides giving off certain poisonous substances called toxins. Consumption may give off millions or even billions of these germs per day in the sputa, excreta, perspiration and breath. These may be communicated to us by means of air currents, dust, milk, solid bodies, as clothing, money, meat, public conveyances and many other ways. When the germs meet with tissue upon which they can thrive, they divide and sub-divide very rapidly. The spores or secondary germs are more difficult of destruction than the parent plant. They thrive better where there is no oxygen or direct sunlight. When kept from these their vitality may be preserved for months or even years; when moist they are practically harmless. Consequently we have the following important keynote:—Dwell so far as possible in the sunshine and pure air, and, if bacilli be present, keep them moist until you have an opportunity of destroying them. In tuberculosis the sputum is the most dangerous agent, and too much care cannot be given to its destruction. Burning is probably the most effectual method. For this purpose use a strong metal box with a handle about three feet long. Invert the box over a fire in the yard or in a stove or furnace used solely for that purpose. Brisk boiling for half an hour in a tightly covered pot will destroy all germs. If disinfectant be used, cover carefully and allow to stand from eight to twelve hours. The quantity of disinfectant should be in excess of the sputum. A five per cent, solution of carbolic acid is excellent.

The bacilli have several methods of entering the human system:—

First (and most common) by inhalation or breathing into the lungs. Many of us who would scorn to drink after another will sit contentedly in a crowded room, breathing the air exhaled from foul lungs. We say that carbonic acid gas is bad for us, but we rarely stop to think that in addition to this we are breathing a still worse element, namely, organic poison, or in other words—worn-out tissue. "Millions of the units of the human family die primarily or remotely and literally for lack of breath" (Playter). Consumption selects its victims from poor breathers, and we may add that correct breathing is the most vital and important function of the body. We hear so much lately along the line, "Tell me what you eat and I will tell you what you are," but we rarely consider that individuals who have lived for weeks without food would die in a few moments without air. Pure outdoor air is plentiful in most parts of our land and lung capacity may be developed. Full breathing promotes the circulation of the blood through the entire body, thus assisting in the elimination of disease and aiding in general nutrition.

Second mode of entrance, by ingestion or swallowing. Consumptives, through a false idea of modesty, sometimes swallow sputum. This is very dangerous, as they run the risk of infecting the already enfeebled body and thereby lessening their chance of recovery. For the same reason a consumptive should never use for the nostrils any handkerchief used for the



lips. The disease is frequently contracted through the use of tubercular meat or milk. If there be any idea that these foods are not up to the mark, give the meat extra long slow cooking and boil or sterilize the milk, particularly if it be intended as food for children.

Third mode of entrance, by inoculation or infection, entering the blood through a cut or abrasion of the outer or inner protective covering of the body.

Children living with consumptives are particularly susceptible to the disease. The vitality of child life is low and easily overcome. When bacilli are projected into the air by coughing or loud talking, they settle rapidly to the floor, and the child not only breathes the disease laden air, but swallows many of the germs.

The subject really resolves itself into one of prevention. We aim at destroying the bacilli. Why not strive rather to build up a healthy body which will give them no condition in which to propagate. Seed will not flourish on every soil. For health we require regularity of living in sanitary surroundings, deep breathing, plenty of oxygen, sunshine, pure water, nutritious food properly masticated, tonic baths, exercise and rest. Here we must make a distinction; exercise is a means of prevention, but for a consumptive the open air rest cure is considered the best treatment, and exercise should only be taken under the direction of a competent physician. Dr. Lawson Long prescribes as a preventive a swing made of a broom stick three feet long, suspended at the middle so that one must give a slight spring to grasp it at either end. He says, "I am mortally certain that if this were to be practiced by the rising generation in a dress allowing free and full development of the body, thousands, yes, tens of thousands, would be saved from the ravages of consumption." Laws against expectoration in public places should be rigorously enforced, and, if the various Provincial Boards of Health could formulate one code to be applied throughout the Dominion, our children might go from the schools prepared to fight this evil, rather than succumb to its ravages. The time is also ripe for the insistence that physical culture be a part of the curriculum in every school for girls as well as boys. The circulation of racy leaflets of two or three pages on:—"How to breathe." "Methods of disinfection." "Is tuberculosis hereditary?" "The danger of promiscuous spitting." "The value of sunshine." "The hygiene of the bath," etc., would be of inestimable value.

Climate is not so important in the treatment of tuberculosis as was at one time supposed. Experiment has proven that the disease may be successfully treated by means of sanitary living in any ordinary healthy climate. It is always better to seek a cure in the neighborhood where one expects to reside permanently. Other things being equal, a rigorous climate gives the best results.

Sanitoriums are doing a splendid work, but, for lack of funds, the accommodation is inadequate. Here is scope for public and private philanthropy which will yield returns a hundred fold. The Muskoka Sanatorium and Free Hospital, also the sanatorium near Toronto for advanced cases, are able to help only a few of the thousands who suffer from and transmit the disease to others.

The Women's Institute is leavening home life in this Province, and the combating of the Great White Plague is one of the greatest phases of philanthropic work with which our women could be identified. Let us study and fight to the death this dread evil.

## QUESTIONS.

Q.—Which is correct, sanitarium or sanitorium?

A.—Both are used. The former means health, but the latter, meaning "To heal," is preferable.

Q.—What do you mean by *Tonic Bath*?

A.—Baths may be divided into two main classes:—

(a) *Cleansing* taken by means of soap, hot water and vigorous rubbing.

(b) *Tonic*.—For the purpose of stimulating the nerve endings, increasing the circulation, invigorating the system, and making one less susceptible to cold. These may take various forms, but the cold sponge is the most universally employed. One must come to extremes of temperature gradually.

Q.—Do not some physicians take exception to the giving off of bacilli in the breath?

A.—Yes. The dangerous element is the sputa sprayed with the breath into the air when speaking or coughing.

Q.—Why are the secondary germs harder to destroy than the original germ?

A.—Because the original germ loses some of its vitality during the process of taking root, while the secondary germ is already rooted in the tissues and has simply to grow.

Q.—Why keep the sputa moist until destroyed?

A.—Because when dry it becomes pulverized and mixes with the air.

Q.—Where may one secure literature *re* Tuberculosis?

A.—Circulars from:—Chas. A. Hodgetts, Sec. Prov. Board of Health, Toronto, Ont.; J. S. Robertson, Sec. National Sanitorium Association, Toronto; League for the Prevention of Tuberculosis, 11 Bleury St., Montreal; Canadian Association for the Prevention of Consumption, Sec., Rev. Wm. Moore, D.D., 128 Wellington St., Ottawa; Maine State Board of Health, Sec., A. G. Young, M.D., Augusta, Maine, Circulars 54 and 70 and "Eleventh Report (50 cents); M. Firestack, 200 W. 96th Street, N.Y., Book, "Tuberculosis as a Disease of the Masses and How to Combat it," by Dr. S. A. Knopf (paper 25 cents, cloth 50 cents); Report of the Henry Phipps Institute, 238 Pine Street, Philadelphia.

N.B.—J. S. Robertson, of the National Sanitorium Association, says:—

(a) In reference to the Eleventh Report:—"I have found this myself most invaluable for constant reference. Probably for general information there is nothing more useful."

(b) In reference to Dr. S. A. Knopf:—"He is probably the best authority on this subject in America."

## SOUPS AND SOUP MAKING.

MISS AGNES W. MACKAY, AILSA CRAIG.

Soup is an article of diet that is not used nearly so much as it should be in the average farm or village home. It is a light, healthful and stimulating food, agreeing with everyone. It is more of a stimulant than a nutrient, as is generally supposed; containing a large proportion of water, there is little nourishment in it. Soups may be given to little children as their first food after a milk diet of babyhood, and are equally valuable for the aged whose digestive functions are weak and need the stimulus supplied by the hot soup. In cases of extreme exhaustion nothing is better



than a cup of hot soup which can have no bad after effects. In the cases cited, a clear meat soup is meant. The cream soups and purees are so nutritious that, with bread and butter, they furnish a well balanced meal.

Soups are of two kinds.—clear and thick, or stock and milk. Stock is the broth resulting from long, gentle cooking in water, of meat, poultry or fish. Pieces of meat which are of little use if otherwise prepared,—tough muscle and bone, shin, neck, or tails and calves' heads.—are used for soups. The flavor, aroma and sapidity of broths is due to osmazome which exists only in flesh and blood and is more abundant in the meat from old animals, and in dark meats. The properties of osmazome are more noticeable in roasted or broiled meats; and, as it excites the appetite and stimulates digestion, it is advisable to brown the soup meat before adding the water. The only nourishment in soup is albumen, a substance found in flesh, and in much greater abundance in blood. It is very much like the white of an egg, is soluble in cold or tepid water, but coagulates when heated; the nutritive properties are largely lost when it coagulates. Hence, soup meat should be put on in cold water—it is better if soaked in the water an hour first—heated gradually and simmered gently until done. In making soup, use about twice as much meat as bone, and from a pint to a quart of water for each pound of meat and bone. Put salt in at first, as it aids in extracting the meat juices. When it has cooked three hours, add seasoning, and mixed vegetables in the proportion of one quarter pound to each pound of bone and meat. Continue cooking until the meat is in fragments, about four or five hours in all. Strain through a sieve and set aside to cool. The fat will form a cake on top, which should not be removed until the stock is to be used. The stock will keep a week in winter and about three days in summer. In hot weather the vegetables should not be cooked in it, but should be added as it is heated for use. In clearing soups, the scum, which contains the chief nutritives, is removed.

The stocks recognized by authorities are four:

*Boullion*—made from lean beef, cleared.

*Brown stock*—made from two thirds lean beef, one third fat and bone, highly seasoned with vegetables, spices and sweet herbs.

*White stock*—made from chicken or veal.

*Consommé*—from beef, veal and chicken, highly seasoned with vegetables, spices and sweet herbs; always served clear.

To these is sometimes added *lamb stock*.

A thoroughly reliable recipe for stock is,—2 lbs. raw meat and bone; 1 lb. cooked meat, or meat and bone; 3 qts. cold water, fresh or from cooked meat or vegetables. To each pound of meat and bone allow one tablespoonful each of carrots, onions and turnips cut in one-half inch cubes, one stalk or root of celery, one bit of bay leaf, one sprig of parsley, two pepper corns or a few grains of pepper. Have the bones sawed in one inch lengths and split. Cut the meat into one inch cubes. If raw meat only is used, brown one-third of it in a little fat in the bottom of the pot. Let meat and bones soak in water one hour, then simmer in a covered kettle four or five hours. About one hour before taking off, add vegetables and seasoning. Strain, and set aside to cool. If desired darker in color, cut an onion in half, bake on a tin plate till very brown, and add to stock with vegetables. From this foundation many soups may be evolved. The addition of sliced vegetables gives a vegetable soup. Macaroni, noodles, and dumplings make other varieties. Made very thick with vegetal'es and pearl barley, it is hotch-potch. It may be thickened with rice & tapioca.—in short, the possibilities are endless.

The milk, or thick soups are:—

*Cream Soups*—made of vegetables or fish, and thickened milk.

*Purées*—very thick cream soups, and perhaps white stock.

*Bisquis*—generally made from shell fish and milk.

The cream soups are a combination of white sauce and vegetable pulp. They are rather heavy for dinner, with meat, but are suitable for the main dish at luncheon or supper. The vegetables are cooked until soft, rubbed through a seive and, except potatoes, are used with part or all of the water in which they are cooked. Add a speck of soda to the milk before heating and it will not curdle. Thicken according to the density of the pulp. All, even potatoes, are better of a little thickening.

The following *Cream of Potato* may be adapted for almost any vegetable:—

Mix one cup of mashed potatoes with one pint of hot milk; add one cup white sauce, flavor with salt, pepper, celery salt and onion juice.

*Bean Soup*. Soak one cup of beans over night, drain and put on to boil in one quart of cold water. Fry one slice of onion in one tablespoonful of butter until slightly brown, and add, with one stalk of celery, to the beans. Let simmer till very soft, adding a little cold water occasionally to check the boiling and help soften the beans. Rub through a soup strainer, put over fire and when hot, add one cup white sauce (made of one tablespoonful each of flour and butter, cooked together and thinned with one cup hot milk). Season with salt, pepper and a bit of mustard, and serve with a very thin slice of lemon in each plate.

*Potato Purée*—(a rich soup). One lb. potatoes, pared and sliced; one Bermuda onion, two leaves celery; one and a half pints stock; one gill single cream; one oz. butter; one half teaspoonful each of salt and pepper. Put potato, celery, onion and butter in sauce pan over fire, stir for five minutes. Add one pint stock and boil until potatoes are done, pass through sieve, adding the half pint of stock, hot, to prevent clogging sieve. Return to sauce pan, add cream, pepper and salt, and stir until it boils. Serve at once.

Soup is an extremely economical food, if care is exercised in its preparation. In small families it will be necessary to buy meat for it, but in large families, the bones and trimmings of roasts, steaks, etc., will serve. In buying meat for soup-making, the cheaper cuts, neck, cross-rib, plate, flank and skin are best. The skin is the most desirable piece for every day stock, as it is so gelatinous. Smoked or cooked meats should not be used. When making soup from left-overs, all scraps of cooked or raw meats may be utilized, and also any scraps of cooked vegetables, the water in which fresh meat, poultry or young vegetables have been cooked, or even a spoonful of gravy. There is almost no limit to what may be done with left-overs, if one brings to the task an ingenious and inventive mind.

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## YEAST AND ITS HOUSEHOLD USES.

By MISS H. A. GLASPEL, TAVISTOCK, ONT.

In bread-making, the management and control of the yeast and its fermentation is usually the least understood part of the operation. It is owing to mistakes in its treatment that the greater number of failures in bread-making are due, for no manipulation of flour or dough will compensate for weak or badly prepared yeast.



At the outset, let me define a few terms that relate to this subject. The term fermentation is as a rule confined to the production of alcohol from substances containing sugar, but in the extended use I shall give it, it denotes the chemical change caused by micro-organisms in substances; for instance the germ causing the souring of milk is called the lactic ferment, and the changes which it causes constitute lactic fermentation. Similarly the production of vinegar or acetic acid is caused by a microbe, and the substance from which the vinegar was made is said to have undergone acetic fermentation. In the fermentation of flour, the sugar which is always found in the wheat grain, is acted upon by a living organism—the yeast plant—and is changed into alcohol and carbonic acid gas, the same gas which causes beer to froth. In baking the dough the alcohol is almost entirely evaporated.

Putrefaction also is caused by minute vegetable organisms and decomposes matter into its chemical constituents. It is difficult, if not impossible, to draw any clear distinction between the process of fermentation and that of putrefaction, but the latter term is usually applied to substances that are decomposing and producing a bad odor. In order that putrefaction may go on, four things are necessary; (1) The substance to be decomposed, (2) the vegetable organisms to cause decomposition, (3) a suitable temperature, (4) Moisture. These are all present in dough.

The last term is bacteria. When any dead vegetable or animal matter is left exposed in a warm moist atmosphere, it immediately begins to decay. This change is caused by the growth in it of minute organisms called germs, microbes, or bacteria. These organisms are the simplest forms of vegetable life and multiply very rapidly by simply dividing, each half again dividing when it has grown mature. Not all bacteria are harmful, for in butter or cheese-making certain forms of bacteria are necessary to obtain good results, but in bread-making bacteria are undesirable and often harmful. Though bacteria are always present in flour, and no practical means has been found to eradicate them, yet if the utensils used in making yeast and bread are kept free from bacteria by frequent scaldings, it will thus reduce to a minimum the probability of having dark or sour bread. Yeast is not a bacterium but is used to ripen dough in a manner somewhat similar to that in which a "starter" (or sample of milk containing desirable bacteria) is used in the dairy business to ripen the cream.

The earliest bread-makers used nothing with their crushed grain to make it rise, hence their bread was hard and solid, and so had to be in thin cakes; nevertheless the use of yeast for bread-making is very old. The Jews were acquainted with the use of "leaven" or yeast, for we read that Lot did make them a feast and did bake unleavened bread. And the use of yeast for making wine is even more ancient, for we learn that Noah, the second father of mankind, planted a vineyard and made wine, and about the year 2000 B.C. Ching Nong, a Chinese philosopher, taught his people how to make bread from wheat, and wine from rice. Baking reached a high state of perfection in Egypt and became a profession at Rome in 170 B.C. After the conquest of Macedonia in 148 B. C., numbers of Greek bakers came to Rome, secured special privileges, and soon obtained a monopoly. Later, a special magistrate was appointed to superintend the public bakeries. From Rome the method of bread-making spread gradually with civilization, and at present, fermented bread is in general use, except in a few of the northern countries of Europe and in other places distant from civilization.

The yeast plant belongs to that division of the vegetable kingdom known as fungi, a group of plants which do not possess any green

coloring matter, and hence must obtain their nourishment from organic matter. The plant consists of a single cell which under favorable conditions sends out from its surface a bud which gradually increases in size. This bud may or may not remain attached to the parent cell.

Under the proper conditions of moist surface, plenty of air, suitable temperature and vigorous cells, small round bodies, from two to eight in number, are formed inside the old cell. These small round specks are called spores and will grow more yeast plants, just as seeds of flowering plants will grow their kind. The spores might be termed the seeds of flowerless plants. Spores may remain dormant for a considerable time, but will germinate again when placed in suitable food. They, like seeds, are more resistant than the parent plant, and though the yeast cell will live for a considerable time in the dry state, yet the spores will start to grow again after being kept for a much longer time.

There are hundreds of varieties of yeast which all act alike but in different intensities. No doubt any of the yeasts would cause fermentation in the flour, but some would require a far longer time to cause the dough to rise to the same extent as another would. Many kinds produce a bad flavor, and others a bad color in the loaf. Bakers' yeast is sold in three forms, viz.: compressed, dried, liquid. The compressed yeast is in the form of moist cake which should break grainy and not stringy; it keeps only for a few days and therefore is not suitable for persons living in the country. In towns it is usually distributed every few days. When free from bacteria, or mould, it is usually the most satisfactory form of obtaining strong yeast, but is invariably more contaminated than that obtained from breweries and distilleries. Dried yeast is sold in the form of dry yeast cakes or powder, and consequently cannot support bacteria. It keeps longer than the moist compressed yeast but loses its vitality if kept too long. Liquid or brewery yeast grows in the fermentation vats, and that which sinks to the bottom gives the best results, being purer. It sometimes gives a bitter flavor, but it is said that this may be overcome by washing the yeast in cold water, and allowing it to settle, the water being then poured off.

The most striking change in dough after the addition of good yeast is the rising or swelling of the mass. This is caused by the action of the yeast upon the sugar of the flour, and to a slight extent upon the starch, which has been changed into a kind of sugar called dextrin. As previously stated the yeast lives upon this sugar, changing it into alcohol and carbonic acid gas. The latter being unable to get away, owing to the sticky nature of the dough, is held in small bubbles which expand when beaten. If the yeast is not allowed sufficient time to make the dough porous, the result is sticky, "heavy" bread. If the yeast has worked the dough too long, then the gluten is stretched too much and the bread is brittle and crumbly.

Different temperatures have as much effect upon the growth of the yeast plant as upon that of other plants. A temperature of between 75 deg. and 90 deg. F. seems to be the most favorable for gas production in the sponge, and the temperature at which the yeast is grown should be somewhat lower than that at which the sponge is set. Although the above figures are near the limits for good fermentation, still the temperature of the flour and the water before mixing must always be taken into account, as must also the temperature of the air. In winter when the flour is cold the setting temperature may require to be as high as 95 deg. F., while in summer it may be as low 70 deg. F. A thermometer should be used, for it is as important in bread-making as in butter-making or cheese-making.

It is also extremely important that the yeast be as free as possible from moulds and bacteria, but it is seldom, if ever, that any bread-making yeasts



are found which are not contaminated to a greater or less extent. While it is often possible to have a yeast contaminated and still obtain good bread, yet it is almost certain that if the yeast-cells become weakened from any cause the bacteria will increase with such rapidity that bad bread will be the result, but when the yeast is strong and vigorous, it holds many bacteria in check and prevents the injury which would be caused by their growth. Sour bread is also caused by microbes, which may be in the flour, the yeast or in the cracks and corners of the kneading trough. It is not possible to free flour from them, but it has been found that the high grades of flour are freer than are the poorer. The yeast may be kept almost entirely pure by good management, and the utensils should be frequently scalded to kill all germ life.

There are many recipes given for cultivation of yeast. Potatoes, flour, malt, sugar and rice are all recommended as constituents. Those most easily obtainable are potatoes and flour, and if care is taken in their preparation, potatoes seem to give the most satisfactory results, the disadvantage with them being that their cracks and eyes are difficult to free from bacteria, so plentifully found in earth. The skins should not be boiled with the potatoes because of the bacteria already mentioned and because of a substance found on the inner surface of the skin, which has a tendency to give a bitter taint to the bread. If flour is used it is better to boil it to destroy the germ life and to gelatine the starch. When the highest grades of flour are used they are more likely to be free from bacteria, but poorer in diastase, hence a little sugar should be added, for this diastase has the power of converting starch into sugar. Hops are valuable because of their antiseptic properties, i. e., they prevent the growth of the bacteria, but do not interfere with the growth of the yeast plant and are non-injurious to the consumer. The hops should be heated in water, but not boiled, else a bitter juice is extracted. After two hours the hop leaves are strained off. By experiments at the O. A. C. it was found that the most advantageous proportion to use is 1 ounce hops in two gallons water. The hops give good results with either malt yeast or potato yeast. For home-baking the following receipts for brews are given:—

## No. 1.

1 lb. potatoes.  
 $\frac{1}{2}$  oz. hops.  
1 gal. water.

## No. 2.

$\frac{1}{2}$  oz. hops.  
 $\frac{1}{2}$  lb. malt.  
1 gal. water.

It is important that the brew should be sterilized by boiling, and then when cooled to 75 deg. or 80 deg. F., the yeast or a part of the old brew, which is pure, should be added. The vessel should expose as much as possible of the yeast to the air and the yeast should be frequently stirred by a stirrer kept in it.

An important point in bread-making is the effect of the process upon the digestibility of the product. There are ways of making bread to rise other than by the use of yeast. The gas causing the hollow globules in the bread is carbonic acid gas, and can also be formed by baking powder and water, or baking soda and sour milk, or by hydrochloric acid. When baking powder and water are used the undesirable product which remains in the bread is tartaric acid. When soda and butter-milk are used then lactic acid is formed. Both tartaric acid and lactic acid are injurious to health, and medical authorities have condemned them both when used as milk preservatives. But when hydrochloric acid is used in making aerated bread, the acid when mixed in the dough is neutralized, if used

in proper proportion, and turns into carbonic acid gas and common table salt, neither of which is injurious. But aside from the by-products, when any of these three substitutes for yeast is used, the bread or cakes are not so digestible, because the starch, sugar and gluten of the flour are not acted upon to the same extent by the quick-acting chemicals, as they are by the prolonged fermentation action of the yeast; consequently this further action must be performed by the digestive fluids.

Aerated bread was first made by Dr. Danglish, who kneaded the dough containing hydrochloric acid by mechanical means and under air-tight pressure. By taking it from the kneading-trough to the oven the pressure was removed and the gas escaping caused the bread to rise while being baked. The advantages of aerated bread are that it is quickly made, it is never sour or bad flavored because the undesirable germs had not time to grow, it is very tight and of uniform quality and good color, but for the reasons given above it has a raw, insipid flavor which causes the consumer to tire of it. Bread may also be made by the salt-rising method, but, as this is the result of a spontaneous fermentation, it is, therefore, a matter of chance whether good bread will be produced, although in places where this method has been employed there is less likelihood of failure, as the utensils and air of the rooms contain large numbers of the desirable germs.

Baking also has a great effect upon the digestibility of bread. The outside of the loaf may be subjected to a heat of 400 deg. F., while the interior is probably not hotter than boiling water. The starch on the exterior is changed by the heat into dextrin, a kind of sugar, which is entirely digestible. In making fancy breads that are glazed, steam is turned on the surface of dextrin for a moment, and the two form the sticky, shiny, substance seen on the loaf.

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## CARE OF MILK AND CREAM FOR CHEESE FACTORIES AND CREAMERIES.

Those who have had extensive practical experience in the manufacture of cheese and butter, are fully awake to the necessity for cleanliness in the production and handling of the raw material; no matter whether the whole milk is sent to the factory for cheese making, or the cream separated on the farm and then taken to the creamery, there is necessity for thorough cleanliness in the cooling of the milk and cream at all seasons of the year. The Dairy Instructors for the Province, the makers in the factories and creameries, and the wholesale merchants who buy and export the goods, are agreed in stating that there is no one point, in connection with the production and manufacture of milk into cheese and butter, which is of greater importance than the proper handling and cooling of the milk immediately it is drawn from the cow, and that it be kept cool and sweet until it reaches the place of manufacture. The great improvement of the raw material during the past two seasons is most gratifying. There is still room, however, for advancement in this respect.

The women of the farm, while not called upon to do so much of the dairy work as years ago, are still in closer touch with the dairy branch than other line of farming operations, and it is to them that we must look to give directions to those who do the practical work, as to proper methods in caring for and cleaning the utensils, cooling the milk, etc. Much of this work is now left to farm hands, and it is well known that the average man requires the direction of some cleanly, up-to-date woman, before he can be



depended upon to properly clean dairy utensils. The woman on the farm can do much to ensure the observance of approved methods, and as this report is read by large numbers of women living in the farming districts, we thought it well to publish herewith copies of notices sent out from the Dairy Branch re the production and care of cream and milk. We trust that those who read these notices will make it their business to see that the recommendations contained therein regarding the washing of utensils, washing and care of separators, cooling of milk, storing of cream, etc., are closely observed.

## TO THE PRODUCERS OF CREAM.

This pamphlet has been prepared for the use of creamery instructors, sent out by the Provincial Department of Agriculture and the Dairymen's Associations, with a view to assisting them in inducing the patrons of creameries to use greater care in the production, handling and delivery of cream. There is, undoubtedly, much room for improvement in equipment and methods in many of the creameries. It has been stated, however, by well-known men in the trade and in the columns of the agricultural press, that the greatest weakness in our dairy methods to-day is a lack of raw material of the highest quality. This is particularly true of the raw material which is delivered at many of our creameries. It would be to the interest of all concerned to have the cream richer, and delivered sweet, every day, if possible.

### THE OBJECTS OF INSTRUCTION.

Instructors sent out by the Department are not employed as detectives, but devote their energies to instructing the maker how best to improve the quality of the butter and the producers how best to supply raw material of the desired quality. Their duties are largely of an educational character. Besides advising and assisting the maker in the best methods to insure a high class product, they will, in many cases, visit the premises of the producer with a view to giving instruction in:—

- (a) The care of the separator and adjusting of the same;
- (b) Best methods of cooling and caring for the cream;
- (c) Necessity for maintaining a large supply of clean and cold water;
- (d) Need of wholesome food for the cow, and liberal quantities of the same, etc.

The Department recognizes the necessity for united effort on the part of the producers of cream and the manufacturers of butter, if the dairymen as a body hope to secure a strong hold in the British market; and towards this end it has been thought well to present in printed form to the patrons of factories some advice and suggestions as to the production and care of cream. The relationship which should exist between patron and maker, and their respective responsibilities, should be better understood by both. The manufacturers, as well as the farmers, are in the business for the purpose of making money, and the farmer cannot hope to get a high price unless he delivers his cream in its best condition, neither can the manufacturer hope to get the best results unless he provides up-to-date machinery and follows the approved methods of manufacturing.

The points presented in this pamphlet will be *instruction* to some, while to many others they will be only a *reminder*.

## PRODUCTION OF CREAM.

In the profitable production of cream one of the essential factors is, that the cows kept shall give a liberal supply of milk, rich in butter fat. We have no hesitation in saying that any farmer would be well repaid for the time spent and expense incurred in making a thorough test of the individual cows in his herd, both for per cent. of fat in milk and total weight produced within the year. In the majority of herds, one or two of the best cows will be found to be returning a better profit than a half dozen of the poorer ones. Weed out the poor ones and encourage the money makers to still larger yields.

The scales and the Babcock test are just as essential to successful dairying as good food and proper management.

We wish chiefly to draw the attention of producers of cream to the necessity for following the best methods of caring for and delivering the cream to the manufacturer. It will not be out of place, however, to here remind the producer of the necessity for providing a liberal supply of suitable food and pure water for his cows at all times; also an abundance of salt. The farmer is compelled to feed sufficient to maintain his stock; it is in the judicious feeding of additional food that the profit lies. Avoid all musty food. Also see that the cows are not allowed access either to weedy fields, sloughs or filthy barn-yards.

Have the patrons made an honest effort to produce a good quality of cream and have it delivered in a clean, sweet condition? If so, they should *demand of the maker* :—

That he put up-to-date equipment in his creamery, that all utensils be kept scrupulously clean at all times, and that walls and ceilings of make-room be thoroughly cleaned and white-washed.

That the churns be thoroughly washed with lime water occasionally.

That the cold-storage be well aired and white-washed, and that all decayed wood be removed.

Is your creamery kept in this way?

On the other hand, he should *demand of the cream gatherers* :—

That samples be properly taken,—no favoritism shown, and that full justice be given to all.

That proper care be taken of the horses and wagon, and that the person and clothes of the driver be clean at all times.

The cream should be protected from the rays of the sun and kept as cool as possible in transit.

## TO THE PRODUCERS.

In drawing the milk from the cow a suitable place should be provided for the work. If the cows are kept in the stable, the hair should be clipped from the hind quarters and tail. See that the stables are thoroughly cleaned and white-washed once or twice a year, and that they are provided with good ventilation. If the milking is done in the open, see to it that the milk is not exposed to dust and bad odors. Do not compel cows to go faster than a comfortable walk. The milking should be done quietly, quickly, thoroughly, regularly, and with clean, dry hands. A little vaseline rubbed on the hands will assist in making the operation easier.

A person suffering from any disease, or who has been exposed to a contagious disease, should remain away from cows and milk.

Do not use wooden or galvanized pails. Discard all rusty pails, cans, or stirring utensils.



Cream cans and pails should first be rinsed with warm water, then washed with hot water, in which a little of some good washing powder has been dissolved, and finally scalded with water as near boiling as possible and placed on their sides in a place where they will be surrounded by pure air and have plenty of sunlight. Always use a good fibre brush for washing dairy utensils and never use a cloth for either *washing or wiping*—The heat of a utensil that is properly scalded will readily dry it. The foregoing directions apply equally to the washing of all dairy utensils, such as pails, cans, separator bowls and their parts, etc.

Do not use a cloth to either wash or wipe utensils.

### SEPARATING CREAM.

The day is past for the use of the shallow pan system for creaming milk. If you have not a separator then use the deep setting system. This demands an abundance of cold water, and a liberal supply of ice should be provided. The separator requires constant and careful attention. First, it must be placed on a firm foundation amid clean surroundings, well ventilated and well removed from stables and bad odors of all kinds. The milk should be run through it immediately after being drawn from the cow. Thoroughly clean the separator after each skimming, taking the bowl apart, washing scalding, and leaving to dry before again putting together. Clean the separator as soon as possible after using, as it washes easier and is less liable to contaminate the next batch of cream. In washing a separator bowl and its parts, follow the directions already given for the washing of dairy utensils. Do not heed the person who advises washing the separator only once a day or twice in two days.

Put a quart of warm or hot water in bowl before starting to separate. This helps the process of separation, prevents cream from lodging, cleans out any impurities, and warms up the bowl. Speed the handle to the number of revolutions indicated; or three to five revolutions more, to get a cleaner skimming and richer cream. Have the speed regular and uniform.

Skim each milking as soon as milked. There is additional loss in the skim milk, more work, and greater trouble when saving one milking over and skimming only once a day. The milk has to be cooled to keep sweet until skimmed, and then warmed again to get a thorough and clean separation. This additional heating and cooling tends to deterioration in quality of cream.

Cool the cream as it comes from the separator or immediately afterwards to a temperature below 60 degrees, and keep it there until called for, not mixing the different skimming until all is cooled. Remember never to mix cold and warm cream.

Provide a special box or tank for holding the cans of cream and keep cold water and ice always around them, having the water in the tank to come up as high as the cream in the can.

Cream testing 30 to 35 per cent. fat gives better satisfaction to both patrons and maker. It will keep sweet longer, there is less bulk to look after, a larger yield of butter is secured and more skim milk is kept on the farm. Sweet, fresh cream of uniform quality, without bitter or other undesirable flavors, will be found most satisfactory to all concerned, and the patron will be repaid many times over for his extra trouble. Do not be misled by the belief that cream slightly sour will show a higher test and thus give you larger returns than sweet cream. Deliver your cream sweet, and see that the other producers do the same.

Variations in the test or richness of cream may be owing to numerous conditions:—Changes in temperature of milk when separating, changes in the speed of the separator bowl, variation in the amount of milk running through the separator in a given time, the amount of water or skim milk used in flushing out the bowl after separating, change in the richness of the milk, seasons of the year, lactation period of the cows, etc.

A thin cream may be obtained by too slow a speed, too heavy feed of milk into the bowl, too low a temperature of the milk, too much water or milk used in flushing out the bowl, or the regulation of the cream or skim-milk screw. A rich cream will be obtained by increasing the speed, reducing the flow of milk and raising the temperature.

*Conclusions.*—Flush out all bearings of machine once per week with kerosene, do not allow too much oil to run in bearings, just enough to lubricate well. Do not leave spoiled milk or cream around machines, but wash it up at once. It is business suicide to send good cream one day and poor the next. It means loss of trade and reputation. The flavor of the butter will be the same as the cream from which it is made; therefore, poor cream, poor butter, poor prices; good cream, good butter, good prices. The production of butter from cream gathered in Ontario is growing rapidly, and from present indications the output from year to year will be greater and greater. We appeal to the producers and manufacturers to do all they can to improve the quality in order that the industry may be placed upon a more substantial basis.

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## PRODUCTION AND CARE OF MILK FOR CHEESE FACTORIES.

### CARING FOR MILK ON THE FARM.

The following notes were prepared by Prof. H. H. Dean, of the Ontario Agricultural College, and are worthy of careful study by every milk producer.

“The cows should be healthy and clean. Colostrum (Beistings) should not be sent to the factory. The stable and pasture should be clean, dry and free from bad odors and bad smelling weeds. The food should be clean, pure, sweet and wholesome. Cows giving milk should not be allowed to eat brewers' grains, distillery slops, turnips or tops, rape, mouldy meal, spoiled hay, or spoiled silage, cleanings from the horse stable, or anything which would tend to taint the milk.

“Either rock or common salt should be accessible to the cow at all times. Plenty of pure water ought to be within easy reach of milking cows. Foul, stagnant, or very cold water is injurious.

“Cows should be milked with clean, dry hands, after wiping the teats and udder with a damp cloth. Milk quietly, quickly, cleanly and thoroughly. The milk should be strained at once after milking, through a fine wire strainer, and also through two or three thicknesses of cheese cotton. The strainer needs special care in keeping it clean. The milk should be removed from the stable or milking yard as soon as possible after milking. It should be cooled at once to a temperature of 60 degrees, certainly below 70 degrees, by setting the cans in tanks of cold water, and by stirring the milk without exposing to the air more than is necessary, in order to facilitate cooling rapidly, and allowing animal odors to pass off readily. After the milk is



cooled to 60 degrees (and where Saturday night's and Sunday morning's milk is to be kept over until Monday morning, the cooling should be as low as 50 degrees in the hot weather), the cans may be covered with the lid or with a piece of damp, clean cotton. By leaving one end of the cotton in the water evaporation will tend to keep the milk much cooler. Night's and morning's milk should be kept separate as long as possible.

"If the milk be placed on a milk stand for some time before it starts to the factory, the stand should be covered and boarded in on the sides, and the whole neatly painted a white color. Milk should be protected from the rays of the sun, from the dust, and from the rain water. There is always a danger of getting undesirable flavors in the milk if it is exposed to the air under the ordinary farm conditions.

"If possible, the cans should be covered with a canvas cover while on the way to the factory, especially in hot, dusty weather. It is needless to say that the wagon, the man, the horses, and the harness should be clean, and a credit to the great dairy industry of Canada.

"Sour whey or buttermilk should not be put in the cans, as the acid destroys the tin and causes the can to rust. Rusty cans cause bad flavors in the milk. It is safer not to put whey in the milk can. A separate vessel should be used for this purpose, if the whey must be returned to the farm. If the whey must be returned in the milk can, it should be emptied at once upon its arrival at the farm, and the can thoroughly washed and aired in the sunshine before milk is put in it again.

"Do not use wooden pails. Discard all rusty pails, cans or stirring utensils.

"Milk cans and pails should first be rinsed in cool water, then washed with a brush and luke-warm water, in which a little sal soda has been dissolved, then scalded and placed on their sides in the sun.

"Do not use a cloth to either wash or wipe utensils.

"The two main points in caring for milk are to have everything clean, and to cool (especially the night's milk) as rapidly as possible to a temperature below 70 degrees, and to 50 or 60 degrees if possible."

"Be Clean." "Keep Cool."

## FOODS.

MRS. LILIAN GRAY PRICE.

To mention the question of foods would almost suggest nothing but a tiresome reiteration of a seemingly hackneyed subject, and yet to many of us, I am sure, it will seem as though we have mastered some few points in regard to foods in an indifferent manner, and there we have stopped. Progress in the definite knowledge of foods seems difficult, at least to those who are not devoting time to specially obtaining such knowledge.

If I were to follow my own inclination in the matter of this talk I should like to take up some points, perhaps not exactly correlated, which strike me as being of salient importance, and which have appealed to me, through years of Institute work, as being necessary for us to think about, and live up to in a more definite, progressive, up-to-date way.

Ever since the commencement of Women's Institutes we have heard of muscle and tissue, with their proteid, or muscle and tissue-building foods; fats, bones, heat and energy, and water, with all the various foods necessary for the proper nourishment of each, until we know that much at least, if we

know anything about food. But do we apply, or try to apply, our knowledge of such facts to every day life and living? If so, is it done in a scientific way, or is it just nice to know that meat will give us some muscle and tissue, and so on with the other foods? Such knowledge is more ornamental than useful, and is certainly superficial. What we need in our Institute work is a regular course of study, beginning with the simple principles and working through to the higher, till we feel that we have gained definite working knowledge, second only to that received at a regular Domestic Science College.

There is a change coming to us in the Domestic industry, and it is simply the change that has already come to every other industry, and to these in such large measure—the professionalizing of every kind of human work—the recognizing that the feeding of humanity is too important a business to be left in the hands of the everlasting amateur. No man nowadays would be willing that his wife should make his clothing, but he is perfectly willing that she should cook his meals, and ruin his digestion. He thinks because she is his wife she is able to cook, and he has taken her for better or worse, including the cooking, but people do not learn to cook simply by being born female.

If a man marries his cook or housekeeper, we say that is a mesalliance, but if he marries a wife and makes her a cook, what is the difference? To prevent such a condition we must make the study and practice of cooking and foods a science. We must understand the composition of the body, and by that I do not mean just to know the five different classes of substance we find in the body, but its composition in detail, with a definite knowledge of its organs, their shape, size and function, with the wonderful mechanism of our bodily apparatus. If we could study this in a systematic way, and master it, how much it would mean to us, as adults, and much more for the welfare of the children, who are fed very often much after the fashion of cramming chickens, but with not such good results.

The adulteration of food furnishes an interesting and valuable topic for study. How little we know of the manifold adulterations of our staple articles of diet. Our ordinary flour and cane sugar we know to be pure, but of how many food stuffs can the same be said? I hope the day is not far distant in Women's Institute work, when we shall map out a line of study in all these branches of the subject, as well as all other home topics, and follow it up systematically and conscientiously, and thus progressively.

It is highly important that we should study the Pure Food Bill, as the American people are carrying it out, to know what it attempts to do. We hear of women's organizations all over the land dealing with questions of the day relating to the social, political and economic welfare of the people, so we should seek to bring about improvements in the food of the people, both outside and inside the home. For instance, we only need to look at the public method of handling meat. It is carted here, there and everywhere in open waggons, often filthy, never very clean, along dusty roads and pavements, for miles, *uncovered*. In butcher shops I have seen the meat supply kept not more than 20 feet from a stable, and in many ordinary butcher shops, meat is displayed on a shelf outside, or in an open window *uncovered*. While the result is not exactly a manufactured adulteration, it is an adulteration of a very bad kind, and it is always well to wipe off any meat whatever, with a clean damp cloth. If you just treat a shank of meat to a sponge bath of clean water you will see what is meant. Now this is just an example, but why could we not as a body of women all over the Province, work quietly but systematically for the betterment of such conditions. This could easily be done in small places at least, where the butcher is amenable to the requests of his



customers. Would it not be a good thing for us to work for food improvements, or improved food conditions outside the home, in some such way as this?

Then inside the home we should try to improve, and professionalize our methods in the use of food. Emerson says,—“To know what to eat, when to eat, and how to eat, is a problem which humanity has not yet solved, although she has enriched herself with a myriad of wonderful inventions.” However, one of the most hopeful signs of the times is the report which comes from teachers of household economics, in women’s clubs, and in schools of Domestic Science, that women are now asking for information regarding food values and home sanitation, rather than recipes for new dishes as formerly. It must be remembered that the children of to-day are the people of to-morrow and the next generation, and the quantity and quality of their individual and vital efficiency in the future depends on the intelligence of those whose duty it is to-day to feed them, to clothe them, and above all, to educate them.

There is certainly much to be improved on in the feeding of children. Mothers, always loving, but sometimes ignorant, begin with the babe, bring it to the family table and give it a taste of everything that comes along. I have many times seen a baby of five months get a sour pickle to suck, or something equally bad to eat. One day at an hotel table I saw a child, eighteen months of age, partake of the following dinner:—Crackers and cheese, soup with broken bread, roast beef, potatoes, turnips, mince pie and a cup of tea. This is an example of a common fact. One day in speaking of proper food for a babe it was mentioned that for the first year of its life milk, and milk alone, is sufficient. A young married woman in the audience who had been getting red and angry for some moments, cried out, when she could contain herself no longer,—“My goodness, you would starve the poor little thing. They often cry because they are hungry, and I just give mine everything it wants and as much as it wants, and whenever it wants it.” Such a woman is likely to learn better when it is too late.

Why does the farmer not begin with the young colt, and feed it everything that comes along? Why does he spend hours and hours in studying foods and feeding for his horses and cattle and pigs?

It pays—how much more, then, will it pay in the case of the human animal. Do let us be impressed with the necessity of this. Build a strong, physical child, and the man will take care of himself.

There is a leaflet, “Food for the Growing Child,” written by Mary D. Chambers, Lecturer, New York, and it is full of valuable information. She says,—“All things worth having are bought with a price. How many will think that sound health, good teeth and digestive organs, which can be trusted with anything in reason, may be considered fairly well insured by a carefully regulated diet during the first fifteen years of life.” She divides the fifteen years into three periods—

1st. From 2 or 3 to 6 or 7. Years before regular school life.

2nd. From 6 or 7 to 12. Elementary School.

3rd. From 12 to 15 or 16. High School age.

For the first period the foods—Milk (1 qt. a day for most children), eggs not oftener than every other day, and never fried); custards; meat not more than once a day; broths, soups, cream, bread, butter, cereals, vegetables, fruits.

Foods forbidden under 7 years.—Cheese, corned beef, duck, goose, game, sausage, headcheese, salt fish, pork, veal and immature meats, hot bread, cake, except light sponge cake; pies, tarts and pastry. All uncooked vege-

tables, bananas, cherries and grapes, except when deprived of skin and seeds; in general all fruits out of season, and all stale or dried fruit. All fried foods and highly spiced and seasoned dishes, tea, coffee, candies.

2nd period.—Milk in abundance, meat once a day, fresh fish, bacon, egg legumes in purees only; cream, butter, whole wheat bread, crackers, cereals, sago, tapioca, light cake. Green vegetables, salads, fruits of all kind.

Foods forbidden.—Cheese, sausage, pork, salted and dried meats, salt fish, hot bread, pies, tarts, pastry, corn, radishes, rich gravies and dressings, tea, coffee. All highly spiced and seasoned dishes.

3rd period.—Same as for the second period.

This is the diet list given by an authority, and we can compare our ideas with these. Many might follow it with advantage.

The keynote throughout, for old and young alike, is common sense and moderation. I often think we use our reason and judgment in everything else, but the human race with all its learning cannot restrain itself in the matter of eating and drinking. By this we do not mean that we should confine ourselves to any one class of food to the exclusion of any other. A mixed diet is best. Civilized man turns to both the animal and vegetable world for his nutriment, and through a long course of adaptation his digestive organs have accommodated themselves to a mixed diet—meat, fruits, vegetables, nuts and sweets, in moderation. But for food cranks and food fadism, there is no excuse. The "middle of the high road" is the safest place for the average intelligent man and woman. Some real scientific knowledge, personal likes and dislikes, common sense, moderation, with cheerfulness at meals, fresh air and sunshine in abundance at all times, will carry healthy humanity pretty safely through this "vale of tears."

As a final word, it seems to me we might well take for our motto in regard to foods and eating, two clauses from the Pure Food League, in setting forth the objects of the organization. They are these:—(1) To consume food in a manner that will produce maximum nourishment with minimum ill effects, thus fitting each individual for largest happiness and fullest success so far as nutrition governs human life.

(2) To promote right living, better citizenship, the higher life of the household, correct methods in business, to an extent that eventually shall make the Canadian people the most perfect on earth, and be a guaranty of quality for Canadian products in the markets of the world.

## FOOD ADULTERATION.

(An Address by Prof. R. Harcourt, O.A.C., Guelph, before the National Council of Women, assembled in Hamilton, October, 1906).

Among the early settlers in this country, when the food of the family was raised from the soil on which they dwelt, and the clothing made at their own firesides from the wool of their own sheep, adulterations and commercial frauds were unknown and unpractised. As our population increased and towns and cities came into existence, it was no longer possible for each householder to produce his own supplies and he was compelled to look to the butcher, the baker and the grocer for the food of which he and his family were in daily need. The accumulation of wealth has developed a demand for a more luxurious diet, and the more or less unnatural and artificial method of living has created a desire for more tempting and highly seasoned foods. Science, too, by furnishing us with a deeper knowledge of the component



parts of foods, has done its share in increasing the number and variety of the articles of our daily diet. Business men have not been slow in catering to the demands of the market, and have made full use of the facts furnished by science in preparing an endless variety of foods for specific purposes. Competition has still further augmented the list and has much to do with the manner in which they have been put on the market. For these and many other reasons the list of foods and condiments now available is almost endless. Many of these foods may be better than the old-fashioned materials; they may be more appetizing, more digestible, and more easily prepared for the table; but, because of their great variety, their prepared condition, the gullibility of the average housekeeper, and the keen competition in business, there are greater possibilities of adulteration and more incentive to fraud in the making up of our foods to-day than in the past.

That the public are awakening to the need of efficient food laws is evidenced by the fact that food legislation is receiving much attention both at home and abroad. In our own country the Dominion Parliament passed, in 1886, an Act dealing with the adulteration of foods, drugs, and fertilizers, and ever since has seriously tried to regulate the character and quality of the foods sold on our markets. The Act has been amended from time to time, but as the Dominion Adulteration Act stands to-day, it defines adulterated food to be: "(1) Such as is diluted with any substance which lowers its quality or strength; (2) such as has inferior or cheaper substances mixed with it, even although these may not be injurious to health; (3) such as may be deprived of any of its valuable constituents in whole or in part; (4) such as is an imitation of or sold under the name of another article; (5) such as is wholly or in part diseased or decomposed; (6) such as contains ingredients injurious to health; (7) if its strength or purity falls below the standard, or its constituents are not within the limits of variability fixed by the Act or by the Governor in Council; (8) if it is colored or coated or made to appear of greater value than it really is."

The Act, however, provided that these definitions as to the adulteration of food and drugs shall not apply: "(1) If any matter not injurious to health has been added in order that the article may be in a fit state for carriage or consumption, provided always it is conspicuously labelled as a mixture; (2) if the food or drug is a proprietary medicine, or is the subject to a patent in force, and is supplied in the state required by the specifications of the patent; (3) if the food or drug is unavoidably mixed with some extraneous matter in its process of collection or preparation; (4) if any articles of food not injurious to the health of the person consuming the same are mixed together and sold, or offered for sale as a compound, and if such articles are distinctly labelled as a mixture in conspicuous characters."

The claim is made by some manufacturers that the addition of a preservative to food does not properly constitute adulteration, because the preservatives added are of greater commercial value than the foods themselves. For instance, a preservative having a greater commercial value, weight for weight, than tomatoes may be used in making tomato catsup. It may be claimed that its addition actually increases the cost of the production. As a matter of fact, however, it permits the tomato pulp to be prepared in large quantities and preserved in barrels in a much less expensive way than can be done without its use. It is evident, therefore, that even though the preservative employed is more expensive than the substance to which it is added, the addition is really made for the purpose of cheapening the product. However, it is not for this reason that such a substance is properly called an adulterant, but, because it is added foreign substance and is neither a food nor

a condiment, and that in the present state of knowledge of the subject these chemical preservatives cannot be said to be harmless.

There are now on the market a large number of brands of commercial preservatives. They are frequently sold with the statement that they comply with all pure food laws, that they are entirely wholesome, and the claim is sometimes made that they are new products. The commercial preservatives usually consist of common substances of well known antiseptic action. The literature regarding the wholesomeness of the so-called chemical preservatives is not by any means agreed, but it is almost universally conceded that formaldehyde and fluorides are injurious, and the weight of evidence is decidedly adverse to the use of sulphurous acid as a preservative of meat products. Authorities, however, are by no means agreed as to the effect of salicylic acid, benzoic acid, and boric acid in the system. As much as one-half per cent. of the latter substance is allowed in butter sold on the British market; but I think all will agree that so long as there is any doubt as to the wholesomeness of any of the chemical preservatives, every effort ought to be made to prevent their use in foods. This is especially true of milk, which forms such a large part of the diet of infants and invalids.

As a result of the claims made by agents in house to house canvass, many housekeepers have been persuaded to buy small packages of what is known as "cold process" preserves. These preparations are sold under the claims mentioned above, and many housekeepers have been led to use them who would not had they known their true character. Unfortunately, they are sometimes accompanied by directions for the preparation of fruits without any heat, and in such cases the amount of preservative employed is often far in excess of that which even the advocates of food preservatives advise.

Fortunately our staple foods, such as the cereal grains, fresh meats, and fresh vegetables, are not adulterated. It is the higher priced prepared foods and condiments that are the most likely to be tampered with.

There is an impression in some quarters that flour is adulterated with gypsum or other mineral matter, or with corn flour, but these forms of adulteration are not practised in this country. Some of the special kinds of flour are not what they are supposed to be, and buckwheat flour and other special articles of that nature are frequently adulterated with cheaper cereal products; but at the present time there is probably no product on our market more free from adulteration than wheat flour.

During the last few years the number of breakfast foods on the market has been enormously increased. Some of these are simply the grain ground after the hull, etc., has been removed, and are true to name. Some, for which exaggerated claims are made, are partially cooked, and others are "predigested" by means of special treatment. There is some doubt regarding the advantage derived from the treatment given to this latter class of breakfast foods, for experiments seem to demonstrate that when thoroughly cooked one class of these foods is as well absorbed as another. Rumors have been circulated that arsenic and other poisonous substances are used in breakfast foods, but they have never been substantiated. The extravagant claims made by the manufacturers regarding the superior nutritive qualities of these foods are to be deplored, for the common oatmeal, cornmeal, wheat farinas, etc., furnish an equal amount of nutrition at far less cost. There is, however, no indication that there is much adulteration practised in the preparation of the breakfast foods.

The fresh meats on the market are rarely subject to adulteration. All varieties of meats that are sold in a finely comminuted state, such as chopped meat, Hamburg steak, and sausage, are likely, though not always, to have a



preservative added. Their use simplifies the keeping of such preparations. One of the most objectionable forms of adulteration practised in connection with meat is the sale of immature calves.

Canned vegetables constitute a class of products relatively free from adulteration by means of foreign substances. Imported peas may be colored with copper sulphate, but the home grown and canned vegetables are rarely colored, the possible exception being an inferior grade of tomatoes. It is said that sometimes saccharin is used as a sweetening material in canning corn.

The class of goods known as fruit products, including jams, jellies, marmalades, and dried and preserved fruits of every description are frequently sweetened with glucose as a substitute for cane sugar, and coloring matter is employed in order that the color of the finished articles may stand for a considerable time on the shelves in the light without deterioration. Apple juice obtained from peelings and cores, the by-products of the manufacture of dried apples, is frequently used in making the cheaper grades of jellies with starch used as a filler and gelatinizing agent. Sometimes exhausted apple residue from the manufacture of jelly is used for the preparation of jams, giving to the latter the seeds and other insoluble material of the fruit supposed to be present, while the soluble material is frequently made up of glucose.

The condimental sauces, spices, cocoas, chocolates, and ground coffees, are quite frequently adulterated with foreign substance, and the sauces, especially the catsups, are very commonly colored and preserved. In the home a single bottle of catsup may be kept open for a long time, and there is a demand for preserved goods in order that the bottle may be kept without deterioration of the contents for some time after it is opened.

In this country there is little or no adulteration of butter and cheese. Coloring matter is used in small quantities in both substances, but the principle governing the legislation regarding coloring of foods in general has not been ordinarily applied to the coloring of butter. There is a growing tendency to use boric acid as a preservative in butter, especially in that made for the export trade. Milk, as is well known, may be, and is too often, adulterated in a variety of ways. Preservatives are sometimes used in both milk and cream, a practice which should not be countenanced in any way, for, they are not only harmful in themselves, but their use obviates the necessity of care and cleanliness in handling milk and makes it possible to put a dirty unsanitary product on the market. Surely, in view of the statistics on infant mortality, babies have difficulties enough in assimilating *pure* milk without having to struggle with preservative adulterants and all the filth they may help to cover.

The enforcement of the Food Adulteration Act is in the hands of the Dominion Inland Revenue Department. According to the provisions of the Act, any officer of the Department is empowered to procure samples of food from any person who has such in his possession for the purpose of sale, and may require such person to show him and allow him to inspect all such articles in his possession, and the place or places in which such articles are stored, and to furnish him such light or assistance as he requires and to give him samples of such articles on payment or tender of their value. This the vendor is bound to do or be liable to the same penalty as if he knowingly sold, or exposed for sale, adulterated articles knowing them to be such. After the purchase has been completed the officer must notify the seller or his agent of his intention to have the sample analyzed by the public analyst, and shall divide the sample into three parts and deliver one of these to the

seller if he requires it. The other two are to be sent to the public analyst and the Department of Inland Revenue, respectively.

In carrying out these directions the officer, after purchasing an article of food and informing the vendor of his intention to have it analysed, is frequently asked as to who will suffer if it is found to be adulterated, and how the vendor is to protect himself if he only sells the adulterated goods in the same condition as he receives them. The answer is, that all goods are supposed to be pure unless otherwise labelled, and that the vendor must suffer if he sells an adulterated article which is not conspicuously labelled as a mixture, or if he fails to secure the warranty from the manufacturer or dealer as provided by the Act.

From time to time the Department make collections of foods which they have reason to believe are being adulterated, and after making the examination, report in bulletin form. These bulletins are available to those interested in the work and help to keep the public informed regarding the purity of the various classes of foods. During the present year bulletins have been issued on the following subjects:—Canned Meats, Honey, Whole Milk, Skim Milk, Butter Milk and Cream, Maple Syrup and Sugar, Fruit Preserves, Commercial Extracts of Lemon and Patent Medicines and Headache Powders. These bulletins show that there is considerable adulteration of the nature previously mentioned practised in all these goods.

The question is sometimes asked, "How can I have foods which I think are adulterated analyzed?" The best way of having suspected adulteration investigated is by notifying the Deputy Minister of Inland Revenue that stated classes of foods are believed to be impure. If satisfactory representations are thus made by responsible persons, the matter will be taken up and thoroughly investigated. The Department prefer to have all samples for analysis collected in a legal way by their own inspectors; since only in such cases can they institute legal proceedings when adulteration is found. The Act, however, provides that individuals may have samples analyzed at their own cost. The results of such analysis are available to the individual in case he decides to prosecute, but the Department cannot in such a case be a party to the prosecution, except as a witness.

There is a growing demand for information on this important subject, and it is right that the public should be deeply interested in the nature of the substances placed in foods. Manufacturers should be compelled to label their goods in such a way that the consumer knows exactly what he is buying and can act accordingly. At the same time, there is an unfortunate tendency to exaggerate the amount and harmfulness of adulteration. There is an honest difference of opinion regarding the wholesomeness of preservatives and other substances added in the preparation of food, and the subject should be treated in a conservative manner. But certainly all cases of pure fraud should be severely dealt with.

There is great need of more education along the lines of the value of pure foods. At present there is a desire on the part of the general public for prepared or semi-prepared foods of a tasty and attractive appearance, and an apparent indifference to the need of a pure, wholesome and nutritious article. So long as this continues we cannot be surprised if business men strive to supply this demand. It costs more to produce pure milk, pure jam, jellies, etc., than it does to produce the impure article, and housekeepers should be willing to pay the price; but they have a perfect right to full assurance that the food is what it is represented to be. The consumer must be led to look deeper into the nutritive value and nature of the food used and to demand that it be pure and wholesome. Would it not be a good



work for the National Council of Women and the Ontario Women's Institutes to help spread reliable information regarding our common foods, and thus help to inspire mothers to see to it that the food placed before their children is the very best and purest that can be procured? Create the demand for nothing but the purest and the best and the trade will supply it.

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The following clipping from *Good Housekeeping* will be of special interest in view of what Prof. Harcourt states in the preceding paper:—

"Investigations by R. O. Brooks, B.Sc., formerly State Chemist of New Jersey, reveals the astounding fact that of the sixty-two brands of flavoring extracts examined (all sold as pure, and at the usual prices for pure extracts), only twenty-six, or not quite forty-two per cent., were legally pure. Fewer still were of really high quality. This shameful condition of affairs is generally true, in many cases worse, with respect to other classes of food products sold in New York city, which are subject to adulteration. The recently enacted national pure food law is powerless to deal with this situation, as it has absolutely no jurisdiction or control over food products manufactured and sold in the same state or city. Only a *bona fide* honest state or municipal inspection of long duration by properly trained, experienced officials, or, better still, an organized public demand for pure food stuffs, such as *Good Housekeeping* is undertaking, can remedy the evil and bring the fifty to sixty per cent. adulteration of those products down to the usual normal of twenty to twenty-five per cent., as is the case in those states where there has been a rigid control of the quality of food stuffs sold for a score or more of years."

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## INVALID COOKERY.

LILLIAN F. SHEFFIELD, TORONTO.

The proper preparation of food is a very important factor both in the prevention and in the cure of disease. Statistics show that two-thirds of all disease is brought about by an error of diet, either by taking too little or by taking too much food, or by a diet that is not well balanced; that is, it does not contain the combination of food elements in the correct proportions. Also disease may be caused by certain germs or poisons entering the body in food or drink. Overeating may cause gout and diseases of the skin, kidneys, liver and other organs. Lack of fresh food may produce scurvy, and an improperly balanced diet often results in rickets. Diseases transmitted by infected milk are diphtheria, scarlet fever, typhoid and many others.

A nurse should understand the importance of the proper feeding of the patient. Care should be taken that the patient's wishes, wherever practicable, are carried out. His likes and dislikes should be observed and also his peculiarity of constitution, so that nothing may be offered him which he cannot assimilate. Food should be given at regular intervals as the appetite usually comes on at certain times, and if the meal is not forthcoming may disappear. The appetite of the conscious patient or that of the convalescent should be encouraged, and nothing done in any way to disturb it.

The sick room requires to be orderly, and no dishes, utensils or food should be allowed to stand about the room, either before or after using. All drink or food should be offered from scrupulously clean glasses or dishes. Dainty dishes, attractive food, and spotless napery ought to be used.

Stale or strong smelling food must be avoided. The nurse should taste the food before taking it to the patient, never in his presence, so that anything wrong may be rectified.

If the patient is weak, the food should be given in such form that he may obtain sufficient nourishment without becoming fatigued. If he is helpless, food may be given from a spoon or from a drinking cup with a spout, or by using a tube and allowing the patient to take food from a glass.

Judgment must be used in waking a patient to give food; sometimes sleep is more beneficial. If the patient is awakened and does not get to sleep soon after feeding, a cupful of warm milk or similar food may induce it.

In fever, the changes taking place in the body are increased while the amount of food assimilated is decreased. The appetite is diminished or lost entirely, therefore it requires tact on the part of the nurse to see that the patient receives sufficient nourishment. In order to nourish a fever patient it is necessary that the food be easy to take, easy to digest and easy to assimilate. Water should be given frequently, as thirst is increased during fever. Plain water is most suitable, but this may be varied in many ways. Lemonade, orangeade, barley water, oatmeal water, toast water and raisin water are all useful mediums through which water may be disguised.

Liquid food is usually ordered in fever cases. Milk is the best of the liquid foods, but as a rule it should be diluted and a small quantity of lime water added; barley water or oatmeal water may be mixed with it. Buttermilk and kumiss are also good. Eggs may be given raw or in the form of albumen water; also meat juices and broths may be used. Variety of broth should be offered in order to avoid monotony of diet. Strained vegetable broths are useful occasionally and gelatin preparations may be employed. Fruit juices are generally relished. The question of kinds of food should be decided by the physician, but the preparation of this food rests with the home nurse as a rule.

During convalescence the diet of the patient requires as much care and attention as it receives throughout the fever period. Often the patient develops a ravenous appetite, due to several weeks' milk diet, so that even greater care is necessary that the patient is given nothing but what is ordered by the physician.

The first addition to the fever dietary may be milk toast, milk and crackers, or junket, and if these are found to be good, other articles, such as soft boiled eggs and the soft part of oysters may be added. Thickened meat broths and finely scraped raw beef reduced to a pulp also lends variety.

\*Children also require special diet, although many parents give their children everything they themselves eat.

(\*See article by Mrs. Lilian Gray Price for list of foods suited to different ages.)

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## CARE OF THE FACE, HANDS AND HAIR.

BY MRS. F. W. WATTS, CLINTON.

The art of looking one's best by beautifying and improving the complexion is easily acquired if one can afford to devote a little time each day to that purpose. Close observation and good taste are necessary for even beauty to display itself to the best advantage. Beauty is a part of woman's wealth, strength and power, and the knowledge of how to procure, improve and preserve it is perfectly legitimate and should be extended.



In health the treatment of the skin is extremely simple, requiring only habitual cleanliness and daily baths. When we know that the skin is composed of three layers of coverings filled with minute pores to allow the escape of perspiration and other impurities, it must be quite clear that constant bathing and friction with a rough towel is necessary to preserve a healthy glow and tone to the system.

Soap should always be used, as the alkali of the soap unites with the oily exudations of the skin and helps to remove impurities. Care should be exercised in purchasing soap, and only a superior quality used. A teaspoonful of strong ammonia put in the bath will make it almost as refreshing as a dip in the ocean, is very cleansing, and is also valuable in removing any disagreeable odor arising from profuse perspiration.

Nothing helps more to insure a good complexion than the use of a cold bath every morning. No one who is not in the habit of taking one can imagine how greatly it conduces to the health, and to the freshness of the complexion. The body should be sponged all over for about two minutes, then rub with rough towels until the friction causes a warm glow to be felt.

Plenty of fresh air and exercise must be taken. An hour, at least, each day, should be devoted to walking. This brings all the muscles into action and promotes a healthy circulation.

Diet is another item to be considered. Use wholesome, nourishing food, avoiding greasy foods, rich pastries and candies, all of which are enemies to a clear complexion. Those troubled with a dull, muddy complexion should use the meal bath. Sew bran or oatmeal in a little sack and use this as a washcloth, adding a little borax or ammonia to the water. Drink plenty of pure, fresh water, either hot or cold, and drink it every time you feel like it. The necessity for drinking water first thing in the morning and last thing at night cannot be impressed too strongly. It washes out the inside canals, thereby clarifying the blood by giving the food, when swallowed, a clear passage to travel through.

If freckles are constitutional you will find it hard to remove them; but, if caused by exposure to the sun and wind, try this remedy. Scrape about a dessertspoonful of horseradish into a cup of buttermilk, let stand twelve hours, strain and apply two or three times a day.

If the face has become roughened by the wind, apply a lotion of equal parts of rose water and brandy.

Here is an excellent recipe for "Skin Food:"

- $\frac{1}{2}$  oz. each of spermaceti and white wax,
- 1 oz. each of cocoanut oil and lanoline,
- 2 oz. oil of sweet almonds.

Melt these in a granite pan set in another pan of water, take from the fire while still warm and add  $\frac{1}{2}$ -oz. each of alcohol and elder flower water and twenty drops tincture of benzoin. Add a few drops of your favorite perfume and beat with a wire egg-beater until smooth and creamy. Will keep well if kept in a cool place, or you can make half the quantity.

Now for those wrinkles and crows' feet. Some of us have taken a closer look into the mirror to-day and the result was anything but satisfactory. We unwillingly admit that Father Time has been writing and telling a tale of the years that have passed. Now I will give you a few hints on how to cheat Father Time out of a few of his markings.

First cleanse the skin thoroughly with rain water as hot as can be comfortably used and good pure soap, then rinse in clear, tepid water and wipe on a soft towel. Now we are ready for the second step. Having on hand a

good cold cream (see recipe for "Skin Food") we will begin with the forehead. Anoint the skin liberally with the cream, then place fingers of the right hand on right temple and with fingers of left hand describe a circular motion, from right to left, beginning at the middle of the forehead and gradually working across to the left temple. Repeat this a dozen times, then reverse hands and use same movement on right side of forehead. Now for the laughing wrinkles at the corners of the eyes. Anoint well with the cream as before and smooth with the tips of the fingers outward and upward.

Now we turn our attention to the cheeks and see what we can do to cultivate a pleasing, rounded contour. Use cream as before, place tips of fingers at corners of mouth, smoothing upward and outward. If the cheeks are thin, massage gently with circular motion, if too fleshy, rub hard, which tends to make firm and reduce the flesh. The chin must have a little rotary motion all its own to preserve its firm roundness. For the lines coming around below the ear rub crosswise. If this treatment is persevered in the results will be most satisfactory.

Now a few words for the care of the hands. We all admire nice hands, and it is most important that the general well-being and cleanliness of the hands be carefully looked after. In the first place the hands should always be kept scrupulously clean, therefore should be frequently washed and dried thoroughly and rubbed briskly afterwards. Not attending to this causes them to chap, crack and become red. Wearing kid gloves at night softens the hands, but the gloves must be large enough to not bind in the least as this would interfere with the circulation. One should save the hands by wearing an old pair of gloves when taking out ashes, cleaning stoves, sweeping, and in all such work that permits of the wearing of gloves. Biting the nails spoils the shape of the finger tips. This habit should never be indulged in.

Equal parts of glycerine, lemon juice and rose water or witch hazel, with a few drops of tincture of benzoin, makes an admirable preparation for rubbing on the hands at night.

It is needless to repeat the oft-told tale of manicuring; so we will have a little talk about the hair. Nothing is more desirable or beautiful than a good head of hair. Indeed it seems to be a woman's crown of beauty. If the hair is harsh, dull-looking and thin, one of the elements of true beauty is lacking. In order to have heavy, handsome hair the scalp must be healthy and clean. Neglect of this frequently produces disease and renders the scalp liable to lose its tone and freshness. Once a month is enough to wash the hair under ordinary circumstances. If the hair is too oily use a little borax, ammonia or salts of tartar in the water. After washing, the scalp should be well rubbed with a coarse towel, or a soft brush may be used to restore a healthy action to the scalp and stimulate the natural secretions on which the hair depends for its vitality and color. Falling of the hair is the result of impoverished glands and a morbid condition of the scalp. What is required is some stimulant that will restore the vital forces of the glands. Sage tea is excellent for this purpose, as is also the following:—Olive oil, 2 oz.; bay rum, 2 oz.; tincture cantharides,  $\frac{1}{4}$  oz.; aqua ammonia,  $\frac{1}{2}$  oz. This owes its virtue to the stimulating powers of the cantharides and ammonia, which rouse the dormant hair bulbs to action.

Here is another good hair tonic. Into a pint of bay rum put a level teaspoonful of fine table salt and twenty grains of quinine. Use every day with gentle massage till hair improves. A lotion, which it is claimed, will cure dandruff contains ten grains corrosive sublimate in five ounces distilled witch hazel, to be applied at night with a bit of absorbent cotton with very little rubbing.



To sum all up, if you wish to retain your beauty and health, rise early and take a cold bath, which stimulates the heart and gives a real, natural and beautiful complexion. It strengthens the nerves, too; gives one an erect carriage, and makes you feel as happy all day long as a little nigger boy in a newly emptied sugar cask.

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## THE ALL-ROUND, OR IDEAL WOMAN.

BY MISS BLANCHE MADDOCK, GUELPH.

This is the subject that has been discussed with interest from wise King Solomon's time to the present day. Allow me to present it (like the preachers) with a first, second and thirdly. First, then, what requirements are necessary for the "All-round woman?" Second, do our women of the present day reach the standard? Third, if not, how are we to reach the ideal standard?

What was the conception of the wisest man in the world of his ideal or all round woman? Note—It is wisdom, not ignorance, that exalts womanhood. Is it not true that in any age or nation the price of the ideal woman is above rubies? Solomon says that first she must have a pure, unselfish nature that will inspire confidence and trust. That is the first requisite for the perfect woman. She must be industrious; she must know how to work with her hands. Remember, these were the ideas of an aristocrat, a king. In the southern states to-day, and in certain circles in Canada, the definition of a lady would be, one who did not know how to work with the hands. A southern woman said a few weeks ago of another woman, "She is a perfect lady; she never made a bed or washed a dish in her life."

Then, too, according to this great wise man, a woman should understand something of the value of foods and the necessity for a change or variety of foods. The ideal housekeeper must not be content to serve up the same foods in the same way day after day. "She bringeth her food from afar." This woman is also a manager, she does not leave the care of her children and the care of her house entirely in the hands of the domestics; she superintends things herself. "She giveth meat to her household and a portion to her maidens." If this practice were carried out to-day, would it not go far to solve "the servant girl problem?" One cannot expect a maid to do the work of a house properly when the mistress has no system and all her plans are spasmodic and out of joint.

Next, our ideal woman must be a business woman. I have heard men say that a girl can scarcely remain a sweet, womanly woman if she is forced to go out into the world to earn her own living or come in contact with others in a business way. "The down is rubbed off" is a common expression. Solomon does not seem to think so; he says, "she considereth a field and buyeth it." Just think of it! A woman in early Jewish times, having enough money of her own—that she had made with her own efforts—earned herself, to invest in the real estate and dry goods business, and yet we find her considering a field and buying it, and examining her merchandise to see that it is good. But in order to do all this she must look after her health; "she girdeth herself with strength, she strengtheneth her arms," or in other words, she took physical culture. This was a busy woman; she led a busy, active life. The great weakness with the really busy woman to-day is, she forgets that she cannot continually make demands on her reserve strength without suffering from it sooner or later. Many women have laughed at the

very idea of their taking time for a cold bath in the morning or a few simple exercises, or even to take time to go to an open window or door, throw back the head and chest, and breathe in a few deep breaths of pure life-giving air before entering on the duties of the day.

Again, this "All-round woman" did not declare, as so many home women do to-day, that, if she looked after her home and her children, she had no time to attend meetings or help those less fortunate than herself. No! "She stretcheth out her hand to the poor; yea, she reacheth forth her hands to the needy." Again, Solomon's ideal was a woman that was fond of pretty dress and a pleasant social life. She was careful that her children and herself were properly and becomingly, and even elegantly, dressed. She was fond of bright, beautiful things, quite an up-to-date woman, but she knew where to draw the line; her mind was not entirely taken up with dress. We find that she was able to converse intelligently, "she opened her mouth with wisdom; and in her tongue is the law of kindness." Women are proverbial talkers, but oh! what wisdom is necessary for the "All-round woman" to meet every requirement. She must be able to answer the myriad questions that are continually troubling the minds of the little ones, who are just beginning to look into the great book of life, and are forever asking the meaning of this or that (to them) great mystery. She must have the right word in season ready for the growing son or daughter or young companion, and must ever be ready with the words of advice or sympathy for the overtaxed husband, father or brother. Then we find this Jewish ideal kept up with the times, she knew what was going on around her, she filled her mind and heart with beautiful thoughts and beautiful memories, that would cause her to rejoice in the time to come. But above all, "she looked well to the ways of her household." Her home was her chief consideration; business, social life, or charity work, were only adjuncts or accessories in preparing her for an ideal home maker. The result was that everyone with whom she came in contact loved her; her children were proud of her and her husband praised and honored her; what a beautiful life to look back upon.

"We shape ourselves.

The joy or fear of which the coming life is made,  
And fill our future atmosphere with sunshine or with shade.  
The tissues of the life to be, we weave in colors all our own,  
And in the field of destiny we reap what we have sown."

If this is a true description of the ideal woman, what about the woman of to-day? We must admit that in many respects she has fallen far short. We have some of the traits, that Solomon has described, in all women, but the difficulty is to find all these traits in one woman. This is the day of specialties; we seem to have specialized women, women who go to one extreme or the other. We have, on the one hand, women who work; work from early in the morning till late at night, but who have no time to look after their health; no time to dress prettily or have any social life. On the other hand, there are women who delight in beautiful clothes, but who (figuratively speaking) never put their hands to the distaff, or in other words, women who are utterly dependent upon others for the making of their clothes. I believe that one of the most important branches of a girl's training in a Domestic Science school (such as the Macdonald Institute) is the "Home Art's Course," where young women are taught the value of the different fabrics, the combining of colors, and the designing and making of artistic costumes.



One great reason for the large number of bachelor men and bachelor maids to-day is the fact that young men cannot afford to marry the average fashionably dressed young lady, and keep up the establishment that she would require. Nor is a girl willing to give up a good salary and a fashionable dressmaker in order to settle down in a small house, do her own work, and make her own dresses.

It is true that conditions have changed since Solomon's time, and social requirements are very different, but it is equally true that any change that tends to undermine the home is striking a death-blow at the future welfare of the nation.

What, then, is to be done? I would reply, train the young girls from infancy to be self-reliant, to understand the value of time. (I have known girls to take one hour every day to dress their hair, and nearly another to dress up for the street or to receive company.) It is only by using every moment, by putting sixty minutes work into fifty, that we can hope to have time for rest or self-improvement, or for stretching our hands out to the needy.

But in order to have all-round ideal women in the future, the health of the girls must be considered. Accustom them to breathe pure bracing air, to take plenty of exercise; to eat plain well-cooked food, and go to bed early. Teach them to make their own dresses and trim their own hats. Teach them the value of truth by setting the example of truthfulness. Not long ago I was in a home at supper time. The little three-year-old girl asked for some butter on her bread. The father said to wait until it was passed, but she persisted in having it at once. He at last took the bread from her, rubbed his dry knife over it, turned it upside down, and told her the butter was on the other side of it. The child turned it over with the remark, "You tant fool me, Daddy." Then, also, one cannot become an "All-round woman" without filling the mind, while a growing girl, with beautiful thoughts. Some one has said, "If a girl was plain looking at sixteen, it was probably not her fault, but a woman that was plain looking at sixty had herself to blame." To sum up, the "All-round woman" must teach her heart to open to every need, must train her head to think and plan for the good of others, and her hands to carry out the behests of heart and head.

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SECOND ANNUAL REPORT

OF THE

Ontario

Vegetable Growers' Association

1906

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE)

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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1907



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TORONTO.

To the Honorable WILLIAM MORTIMER CLARK, K.C.,  
*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOR:

I have the pleasure to present herewith for the consideration of your Honor the Report of the Ontario Vegetable Growers' Association for 1906.

Respectfully yours,

NELSON MONTEITH,  
*Minister of Agriculture.*

TORONTO, 1907.





# Ontario Vegetable Growers' Association

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## REPORT OF THE SECRETARY-TREASURER.

The following is a copy of a brief report of the year's work of the Association as mailed by the secretary-treasurer to the branch Associations, for consideration at their annual meetings held during the first week in December:

On behalf of the Directors of the Ontario Vegetable Growers' Association, I beg to report that during the year ending November 30th, 1906, the Association has been able to accomplish much valuable work for the vegetable growers of the Province. New branches have been formed at Ottawa, Kingston, Tecumseh, Brantford and Scotland. The Association has now ten branches, with a total membership of 509, composed as follows:—Toronto, 200; Hamilton, 81; Ottawa, 39; St. Catharines, 29; Sarnia, 29; Kingston, 27; Scotland, 26; Chatham, 26; Brantford, 16; Tecumseh, 16; odd members, 20. Although the youngest, it is now the strongest and most representative organization of the kind in the Province.

During the year 1906, meetings of the full Board of Directors were held on February 7th, March 15th, June 21st, and November 7th, and meetings of the executive committee on March 8th, May 22nd and Sept. 22nd. Early in the year your Board of Directors approached the Hon. Mr. Monteith, Minister of Agriculture, and urged that an expert vegetable grower should be appointed to the staff of the Guelph Agricultural College, and also that a representative grower should be sent to visit the Northern States for the purpose of seeing what work is being attempted in those States for the benefit of the vegetable growers. Both requests were granted, Mr. McMeans, of Brantford, being appointed to the staff of the College at Guelph, and later sent on a trip to the States. A description of the main points of interest to vegetable growers observed by him during his trip was published in the official organ of the Association.

Early in the year a committee from your Association waited on the Dominion Government at Ottawa and urged the appointment of an appraiser, whose duty it would be to place a valuation on the vegetables imported into Canada. Owing to the fact that the revision of the tariff was under consideration by the Government, no definite answer was given to this request. Little hope was held out that an appraiser would be appointed, but it was intimated that a specific duty might be granted. At a meeting of the Board of Directors held March 15th, 1905, the revision of the constitution was given careful consideration. A number of changes were made in the constitution.

(Note.—The constitution as amended is here published).

In compliance with a request received from the Ottawa branch, information was obtained early in the summer in regard to the by-laws that are in force in the various cities throughout Ontario concerning the hours for selling vegetables. This information was compiled and supplied to the various branches.



The various branch Associations having reported in favor of the Ontario Association issuing monthly crop reports on the vegetable crop conditions throughout the Province, arrangements for the publication of such reports were made early in the year. These reports have been published in full in the official organ of the Association, and summaries of the reports were sent monthly to the leading papers throughout the Province. This line of work has met with general approval on the part of the members of the Association.

During the summer it was decided to offer \$125 in prizes for essays on the growing of potatoes, cauliflower, celery, tomatoes, and onions. This competition aroused considerable interest, and led to a number of essays being submitted. The prize winning essays were read at the annual convention held early in November in Toronto, and will be published in the next annual report of the Association.

With the idea of ascertaining what work is being carried on at the Guelph Agricultural College and at the Central Experimental Farm at Ottawa for the benefit of vegetable growers, committees were appointed to visit these institutions. The committees were instructed, not only to find what work is being done, but to make suggestions for new lines of work. Reports of these committees were presented at the meeting of the Board of Directors, held in Toronto, November 7th. No action was taken in regard to the report presented by the committee who visited the Central Experimental Farm at Ottawa. The committee who visited the Ontario Agricultural College at Guelph reported that but little work of value to vegetable growers was being conducted there, that the representative of the vegetable growers on the staff was not being given an opportunity to carry on the line of work that the Association desired, and that there seemed to be a lack of harmony between the heads of the different departments. Credit was given to the College for certain valuable bulletins that have been issued and for experiments in the growing of potatoes, and for certain other lines of work. Your Board felt that the matter was of importance, and later had an interview with the Hon. Mr. Monteith and urged that more attention be given to the growing of vegetables at the Guelph Agricultural College, and that the representative of the vegetable growers should be given a freer hand. At the same time the request was made that the grant to the Association should be increased from \$600 to \$1,000. The report of the committee was left in the hands of the Hon. Mr. Monteith. Since that date Mr. Monteith has written your Board stating that the matters urged by the vegetable growers had been brought to the attention of President Creelman of the College, and that in every way possible the desires of the vegetable growers of the Province would be acceded to.

During the year your Board has purchased bulletins on vegetable growing from the Vermont and Michigan Experimental Stations, and copies of the bulletins were mailed to all the members of the Association. It is the intention of your directors to purchase such bulletins, issued by the various experimental stations, as they think will be of value to the members of the Association.

The desire having been expressed that copies of the constitution should be printed in French, this was done. It is anticipated that branch associations will be formed at Windsor and in other sections where there are a large number of French vegetable growers.

During the year your Board co-operated with the Board of the Ontario Fruit Growers' Association and other organizations in the holding of the Ontario Horticultural Exhibition at Toronto, from November 6th to 10th.

Over \$300 was offered in prizes for vegetables. The competition in almost every class was keen, and it was generally admitted that this was the finest exhibition of vegetables ever held in Canada.

At the time of the holding of this exhibition the annual convention of your Association was held, at which speakers were present from outside points. Much interest was taken in the various sessions, a full report of which will appear in the next annual report of the Association.

During the summer many of the branch associations have conducted work of much value to their branches, including the purchase of supplies and the holding of regular meetings for the discussion of matters pertaining to vegetable growing.

Arrangements are being made by your Board of Directors for the holding of a series of meetings by the various branches, for which meetings speakers will be furnished free of cost by the Farmers' Institutes.

Enclosed you will find a statement showing the receipts and expenditures of the Association to date, with the balance on hand.

Respectfully submitted,

H. B. COWAN,  
Secretary-Treasurer.

### FINANCIAL STATEMENT.

#### RECEIPTS.

Government grant .....	\$600 00	
Balance on hand, December 1st, 1905 .....	498 27	
Membership fees .....	257 10	
Entry fees, Ontario Horticultural Exhibition, 1905...	37 95	
Interest .....	1 00	
		<hr/> \$1,394 32

#### EXPENDITURES.

Ontario Horticultural Exhibition, 1905 .....	\$165 00	
Ontario Horticultural Exhibition, 1906 .....	150 00	
Official organ .....	289 70	
Committee expenses .....	250 65	
Annual meeting, 1905 .....	57 90	
Annual meeting, 1906 .....	30 05	
Organization expenses .....	158 13	
Sundries (stamps, printing, stationery, telegrams, express, etc.) .....	81 80	
Membership rebates .....	2 85	
Purchase of bulletins .....	8 90	
Crop reports .....	29 85	
Prizes for essays .....	107 90	
		<hr/> \$1,332 73
Balance on hand, Dec., 1906 .....	61 59	
		<hr/> \$1,394 32

Signed,

H. B. COWAN,  
Secretary-Treasurer.

Audited and found correct, P. W. Hodgetts.



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## SECOND ANNUAL CONVENTION.

The second annual convention of the Ontario Vegetable Growers Association was held in the City Hall, Toronto, November 8-9, 1906. The attendance was gratifying. The committee room in which the meetings were held was well filled at each of the meetings, and the interest evinced in the proceedings was marked. The president, Mr. F. F. Reeves, of Humber Bay, presided at the various sessions.

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### PRESIDENT'S ADDRESS.

By F. F. REEVES, HUMBER BAY.

In opening this second annual convention of the vegetable growers of Ontario I am not going to detain you with a speech. We can congratulate ourselves on the growth we have made during the past year. At the present our membership is 509. Branches have been established in Sarnia, St. Catharines, Brantford, Tecumseh, Kingston, Chatham, Toronto and Ottawa, and I think before the end of the year there will be one in Guelph, and I am in hopes that we will be able to form one in London. We have tried several times to get in touch with the growers around London and we are going to try again. We made an effort to organize a branch association in Napanee; a meeting was called, which I attended, but unfortunately the crowd did not turn up, and our efforts were not successful. There are seven members of the association in Napanee, and they have promised to try again this winter, and I am in hopes that we will be able to establish an organization in that place. Another place where we will make an effort to branch out is Windsor. If we want to keep the Association in its present healthy condition we will have to branch out as much as possible. We had the best directors' meeting yesterday that we have ever held. We notified the Minister of Agriculture about one or two little points, that, I think, will be adjusted.

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### EXPERIMENTS WITH TOMATOES.

By GEO. A. ROBERTSON, ST. CATHARINES.

The captain of a steamer which plied on the New England coast was once going through a narrow channel which formed the entrance to a well known harbor, when a passenger said to him, "Well, captain, I suppose you know every rock in this channel?" He replied, "I know most of them." Just then the ship ran on a rock, and he added, "There is one of them now." So with tomato growing. Success comes sometimes, all is smooth sailing, and one is about to congratulate himself on his past years' efforts, and thinks that last spring the seed came up well, the plants were well grown, the land was in good shape, they were planted out just so as to miss the last cold weather, there was no check in the growth and a good crop was the result. "At last," we say, "we have found out what to do and what not to do;" but the following year the weather conditions change, we have struck a hidden rock, and the cause is attributed to bad luck.

The subject, "Experiments with Tomatoes," may be better named "Tomato Growing," for each season's growth, with changed conditions, newer varieties, new methods of culture, the varying demands of the markets, and the introduction of new diseases will probably keep the business in the experimental stage for some years to come.

The tomato (*Lycopersicon esculentum*) is closely allied to the potato, on which vine it may be grafted. It is a native of tropical America, and is most largely grown in North America, where it has reached its highest state of perfection. The tomato has come into common use only during the last century, and is to-day one of the fruits most exclusively used for canning purposes. Being of tropical origin, we have the key to its treatment for best results, namely: Heat, and the necessary amount of moisture.

Tomatoes have many species, many of which are ornamental; but the common one with which we are dealing is divided into two classes, early and late. The late are the main crop varieties, and include the well known canning varieties, mostly all are of good quality and conform closely to the American standard, *large, globular, solid, and smooth*.

The early varieties are, as a rule, not so vigorous in growth, they bloom earlier and bear fruit earlier, and as a class the fruits are flatter, not so deep from stem to blossom end, rough or corrugated on the outside, smaller in size, and often a greenish tinge on the stem end, while the blossom end is quite ripe, but on account of their earliness command the highest price, and if given the proper care are often most profitable to grow.

When starting to grow early tomatoes, we first procure the seed, and we ask ourselves the question, "What is seed?" By the aid of a microscope we see in the seed the germ—the future plant—folded up in order. In one end of the germ are the seed leaves, while in the other we see the miniature roots. The germ is a small part of the seed, the other part consisting of various materials which, when germination takes place, are rendered soluble, and go to nourish that germ until the germ leaves above ground and the rootlets below are developed sufficiently, when, under proper conditions, the plant is able to perform its own functions. Hence the necessity for plump seed, and of strong vitality. But seed is more than this. It is a means of the perpetuation of the species, the perpetuation of the variety; and, what is more, it perpetuates, to a certain extent, the individual characteristic of the parent plant.

Several years ago this was brought prominently to my notice. I had numerous varieties under test, and came across a small packet of tomato seed named Ruby. Two rows of plants through the plot from this seed produced only a medium amount of vine and fruit unlike any "Ruby" I had ever grown, in that the fruit was so flat and rough that there was not one tomato of marketable quality, and all were much inferior to anything I have ever seen. The following season I tried Earliana. It proved fairly early, a good cropper, and of fair size, but many of the later ripening fruits were rather too irregular to compete with the later varieties. The following season I got some of the same variety of seed elsewhere. The type was much better, and I then started to carefully examine each vine. I drove stakes to mark several of the best loaded, farthest developed, most uniform sized, deepest fruited, and smoothest fruited vines, and allowed the best tomatoes to ripen. Then I washed out the seeds carefully, allowing all the small, partly developed seeds to float off with the pulp, and carefully dried the largest and plump seeds. I have followed this plan since, and now have the fourth selection. My seed vine this year had not one ill-shaped fruit, had eight and nine fruits in a cluster, smooth, clean skinned, more evenly



colored than formerly; and my entire crop has been improving while the percentage of unmarketable tomatoes is less each year.

Having thus taken care with the seed, we usually plant the end of January or the fore part of February. The seed bed should be fine in texture, fairly rich, and located in a warm and sunny spot in the green-house. Care should be given in watering; an excess of water, especially during dull weather, will cause the plants to "draw up," and the weak spindly growth, if the soil is not stirred, will often fall a prey to "damping off." When the plants show their second leaves they are pricked out in rows, two inches apart and one to two inches in a row. This process is repeated as often as necessary, widening the distance as the roots develop and the tops expand, then they may be potted into pots of suitable size; four-inch is commonly used, while some growers prefer to again shift them to six-inch pots. After the roots have got a good hold of the soil, harden the plants off in cold frames if the weather will permit, giving ample room for each plant to develop laterals. These can then be planted out as soon as the ground is warm enough, and the weather is favorable, which is usually about the time the buds on the trees are breaking forth; then they suffer no serious setbacks, and the already formed fruits continue to grow.

Next in order is the *soil*. It should be warm. A well drained soil is usually the warmest, as the excess of water runs off, while if the land is wet the heat from the sun is first used to evaporate the excess of moisture, and naturally a gravelly or sandy soil will drain most quickly.

How shall we *manure* the land? We sometimes hear that land for early tomatoes should not be too rich, this is a very indefinite statement. It is not so often a question of over richness as that of less manuring. Fresh barnyard manure, applied to the land the same spring just before planting, was followed by an excessively wet season, and an excessive growth of vine was had at the expense of early maturity. A piece of heavier poor land that for years had never had any manure, this same wet season produced a profitable crop of early tomatoes, while it never has done so in a dry season. An excessive use of nitrate of soda has produced vines at the expense of early maturity on sandy loam in good heart, while the heavier clay land has responded to the use of nitrate of soda in an increased crop. For the average season, sandy loam well manured with barnyard manure for a previous crop, then plowed and worked in the spring and manured with a good high grade phosphate (14 per cent.) at the rate of 600 to 800 lbs. to the acre, and muriate or sulphate of potash 300 lbs. to the acre, will give good results. If the plants are slow in starting, giving enough nitrate of soda to start them, but not to prolong the growth, will prove beneficial.

Late tomatoes are handled somewhat differently. The land should be in good health, and clean and rich. The seed if planted towards the end of March will give good results. The seedlings may be transplanted into hot-beds—or, rather, cold frames with about four inches of manure under—to give a little bottom heat only. The distance apart should be about four inches. A steady growth is maintained, and when danger of frost is over they may be transplanted directly into the field, planting about five feet apart each way. The same general cultivation for both early and late is constant stirring of the soil by a horse hoe or scuffer, deeper at first, gradually getting shallower when growth of vines will make work among them impossible. As a crop is the main object, late tomatoes usually respond to the application of nitrate of soda by an increased yield. If the ground is not already rich in nitrogen, phosphoric acid and potash are the fruit-producing constituents most necessary.

There are a great many drawbacks to tomato culture. A very common one in early tomato culture is sun scald, or hardening of that portion of the fruit most exposed to the sun's rays. A blight most destructive in the South kills the vines quickly. This is due to a bacillus, or germ, not common in this section. Then there is another form, supposed to be a mildew, which wilts the leaves from the bottom of the vines up. But by far the most destructive and most common the last season was the "Tomato Rot," or "Blossom End Rot," when the fruit turns black and rotten at the blossom end before ripening. It is sometimes caused by an excessive growth of vine to start off with, then a sudden check by drouth, or by lack of plant food which makes the fruit most subject to rot. The best remedy is prevention, by having a fresh piece of land each year to grow the crop, and so changing of the earth each year in which the plants are grown, and avoiding these conditions which predispose the crop to rot.

Lastly, in fruit and vegetable culture, it is not what we grow but what we market successfully that pays; and the utmost care should be taken in the selection of the variety or the strain. Among the late tomatoes, some varieties are much later than others, and a week's difference in ripening may save a few hundred bushels from frost. It is needless to mention varieties, as each grower has his favorite. That somewhat newer variety "Success" has given me good satisfaction on account of its comparative earliness and good qualities.

MR. J. RUSH: Would an application of nitrate of soda about three weeks before the tomatoes were ripened do away with the sun scald on the early fruit? I think that would make a little extra growth of leaf.

MR. ROBERTSON: Unless you put the leaves over the fruit to protect it, I do not think it would have the desired effect. We have not time to do it at that season of the year, because we have the cherries to pick. If I had nothing else to do but grow tomatoes I would try a number of experiments to find out what would help in matters of this kind.

A MEMBER: What amount of nitrate of soda do you use around these plants?

MR. ROBERTSON: I was going to say a thimble full to a plant would be a pretty fair application, it depends on the soil.

Q.—Sandy soil?

A.—Yes, manured, with barnyard manure the previous season, and there might have been some of it left in there, and it will give up its nitrogen as it decays. I sometimes use a fertilizer with a little nitrogen. I want it in such soluble form that the leaf growth will stop and the vine will produce its fruit. I want to get a crop of early fruit, and, therefore, I avoid the excessive use of nitrogen. I would put a great deal more nitrate of soda in there so that the plant will stop growth and start growing fruit.

Q.—Did you ever try an application of nitrate of soda?

A.—I would if I were growing a late tomato, but I prefer to handle it cautiously. It is like a medicine. You can have your land so lacking in vegetable matter that an application of these mineral fertilizers is practically wasted on the land, except under very favourable weather conditions. In other words, to pour food down a man's neck is not of any use to him unless his stomach is in working order, and he can make use of it. It is not what we eat, but what we digest.

MR. ADAMS, Leamington: You mean that this blight that comes on the vine may be perpetuated from year to year by using the same ground?



A.—Yes, that has been the bugaboo of tomato culture in the south. In our district we are thoroughly up-to-date in controlling insect and fungous diseases. We seem to get them first, and we have to understand them.

The CHAIRMAN: Do you think that if you changed your land that you could check, to a certain extent, that dry, black blossom rot?

A.—I would not say that. I know it is a fungous disease. If we leave any rotten tomatoes on the land, a fungous disease will reproduce itself. I do not say that it will get rid of it, but it is a preventive measure. You will harvest more tomatoes off fresh land.

Mr. F. F. REEVES: I planted about a half acre of tomatoes on a piece of land that I did not have tomatoes on before; it was sod last year, and we had a great deal of black rot. It was plowed twice and disked over, and I had that black rot there, and it almost destroyed my crop.

Mr. ROBERTSON: Bailey gives as the cause of excessive rot the excessive growth of vine and damp weather. If the land is heavy there is excessive growth of vine.

Mr. F. F. REEVES: It was not the dampness in this case.

Mr. ROBERTSON: In our section they say that it is the dryness that causes this.

Mr. F. COLLINS, Chatham: Don't you think the season might affect that?

Mr. J. RUSH: I think it is very similar to tomatoes in the greenhouse. I have an idea that the disease is reproduced from year to year. Three years ago we had the same result all over the country. There was something the matter with the seed that was sent out by the seedsmen.

Mr. ADAMS: Don't some varieties rot more quickly than others?

Mr. ROBERTSON: Yes, Ignotum. I would not grow it if you gave me the seed. The canners around our section favor Success. I favor it myself, because it is a little earlier in ripening. I had a good show bird, but it was the poorest layer in the flock. I set some of her eggs and raised chickens, and they were poor layers. Chickens from good layers made money for me, but I believe we are only touching the fringe of the benefit of selection of seed in vegetable growing. I think that many of the varieties which we see on the seed growers catalogue are only separate varieties on the pages of that catalogue. They are just certain different strains which vary a little from the same type.

Mr. F. F. REEVES: Talking about seed selection, I noticed when I was over at St. Catharines at your place that your Earlianas were the brightest fruit I had ever seen; they were plump and deep and ripe all the way around.

Mr. ROBERTSON: I noticed an article written by Mr. Raynor, of the Seed Branch of the Department of Agriculture at Ottawa, on that subject, and it is a little bit overdrawn in one thing, in that he said that I have got a permanent strain. I have an improved strain. I have saved seed from my best vines. I had several vines staked out, but I saved seed from only one vine. One gentlemen took some of these seeds, and I asked him to get a couple of samples of the original "Anas," and Mr. Clark sent for them, and that is how I am responsible for that article. I have had numerous letters asking for seed, but I have not any seed except a little for myself.

Mr. T. DELWORTH, Weston: Some varieties of tomatoes seem to be more susceptible to the rot. I found Chalk's Early Jewels are the best. We have had a little rot in it, but not so much as I have found in other tomatoes. I find they have good shape and good color.

Mr. ROBERTSON: When I first started growing asparagus we had no trouble, but now we have all kinds of beetles, and I do not know how many kinds of fungous diseases.

Mr. BUSHEL, Kingston: The asparagus beetle comes every year, but it does not come with the seed.

Mr. J. RUSH: I knew a man who could grow tomatoes with very little vine, but he suffered from sun-scald. The first crop of tomatoes are planted 3 feet 6 inches each way, and do not begin to cover the ground, and he has plenty of fruit. I think it would have paid him to have his tomatoes covered with umbrellas. I must tell you a little experience I had some years ago with the Imperial. It was a very fine tomato for three or four years. I had an acre of onions that were 8 inches high, and one morning they all turned yellow, and I had them plowed up. I buried two rows of onions, and left a deep furrow between the rows. This was about June 20th. I had raised a lot of Imperial tomato plants for a man, and he did not come for them. I had about 4,000 plants 3 feet 6 inches long, and we took them up to this land on June 20th, and laid them down in the deep furrows, and I never saw anything go along like them; the crop beat anything I had ever seen. A canning firm in Owen Sound sent down to see if I could fill a car, and I picked 580 bushels in a week. We would almost get a bushel from 4 plants. Next year I said, that is the tomato for me, and I saved my own seed from my selected tomatoes and planted them, and 2-3 of them had black rot; they were planted on the same kind of soil.

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## GROWING TOMATOES UNDER GLASS.

By C. GIBBARD, TODMORDEN.

In this work, the first thing a person wants to think of is the kind of tomato to grow. There is no use getting late tomatoes to grow in a greenhouse. I have tried it. I have been told that the Stone was a good tomato to grow in a greenhouse. It is very nice, what you get of it, but it is too slow, and takes too long to ripen, and there is not enough fruit on it. Last year I tried Chalk's Early Jewel. It is a nice tomato and a fair cropper, but I do not think it is as heavy as the Earliana and Earliest of All. I think they are the two best tomatoes for growing in the greenhouse. Last year I grew all Earliana, with the exception of a few of Chalk's Jewel.

Mr. T. DELWORTH: What class of Earliest of All did you get?

A.—What we have had we got from The Steele-Briggs Seed Company, but I do not like it because it is not smooth enough. Mr. Westwood grows Earliest of All. He has a good strain and always saves his own seed. For growing tomatoes in the greenhouse, what we want is not something that will give us a few really choice tomatoes, but something that will give us a good, big crop. It may be all right for some one who is growing them as a hobby, and who is satisfied to get some choice tomatoes, but we want a good paying crop. We must arrange our crop so as to interfere as little as possible with the growing of lettuce and radishes in the winter. In preparing the ground for tomatoes, I do not make any special preparation of it. The fall before I start my greenhouse I put on a heavy coating of well rotted manure. I do not think fresh manure is any good.



Mr. COLLINS: Do you grow the tomatoes on benches?

A.—We have ground beds. If you think of growing tomatoes on benches I do not know anything about it. I have tried it and failed completely. I plant my lettuce and radishes and grow them through the winter until we are ready to plant the spring crop of tomatoes. The time to sow your seed is very important. It is something we have got to find out for ourselves. If you have a warm house your tomatoes will come along faster. It depends a great deal on the soil. You have to find out for yourself what time to sow your seed. I sowed my first seed about the second week in January last year, and I followed it two weeks later with another box. I sowed the seed in flats two weeks later, and I put in another, and the tomatoes came along at three different times. You will find out the importance of that when you begin to plant out your beds. When the plants get big enough to handle easily I set them in flats. I set them out about three inches apart, and leave them there until they begin to grow, and then I move them. Have your beds ready to set them into. I put them in pots or berry boxes. This takes up a little room in your house, but you will find that it will pay.

I like to get a good strong vigorous plant, and do not like a long spindly plant at all. While the plants are in the boxes, in the flats, or in the pots be very careful in watering. If you have them in flats, or in shelves you are very apt to water one side of the box and leave the other side dry, or one box will get a heavy dose of water and another get very little. That is something you need to be very careful about, because if you allow the plant to dry out and get checked and stunted you will have a very poor crop of tomatoes. I would commence planting my beds about the second week in March; I think about March 20th. The beds are about six feet wide, and I put five plants in a row across the beds and the rows two feet apart. I find that gives plenty of room for the tomatoes and gives me room to grow a double row of lettuce between the tomatoes, and that will give you a crop of lettuce while your tomatoes are growing. The lettuce should come off before the tomatoes are far enough advanced to be injured by them. When the lettuce is off you will find your tomatoes need attention; and it will pay for the attention you give it. If they are neglected at all you are sure to lose. You will find that they need trimming and staking up by the time the lettuce is off. We had wires along the roof of the greenhouse, and then strings from that to the bottom of the plant, and we wound the plant up the string. That was a good plan, but I found that it was too heavy on the roof of the house, and I have taken these strings down, and I am using laths instead. The laths are a little more trouble, but they are easier on the house. I put a four foot lath on each plant and tied them up to that, and I picked off all side shoots, and only allowed the main shoot to grow. Some growers like to allow a couple of shoots to grow, but I think it is better not to do so. A man I know, attempted to grow tomatoes, and he put them in a pail underneath a bench and cut a hole in the bottom of the bench and ran the tomatoes up through. He did not get any tomatoes. Another man planted them about seven inches apart all over the bed, and let a couple of vines grow. He said if you had them any thinner you could not get any off, but he did not get any off them. But these two men are now the two best growers of tomatoes around Toronto. They grow the best tomatoes and the most of them, so far as I know.

In growing tomatoes you will find it important to have three different sowings of seed. Of course when you are growing lettuce all the time and radishes it will be some trouble before you get the plants all planted out.

Some of them will be so big that you will have to hold them back, and they never do as well after they have been checked.

I do not like to plant them when they are too far advanced; I like to see them just budding for flowers when they are planted out. If you have two bunches of flowers on the plant when you are setting them out you are likely to lose one of the bunches if your first lot of plants are getting too far forward. I would prefer to throw them out; it does not look nice to do so but it will pay you. A small plant that has been growing steady is better than a good big plant that has been held back. After you start trimming you should watch them carefully and keep the side shoots well picked off, and do not let them get too big. You will find that in good growing weather it will keep you going over them pretty well. As soon as the side shoot gets up to the top of the lath, pick it off, and you will have no more vine growth, and the growth will all go into your tomatoes. When you water give them good water. I do not like going over them every day and giving them a sprinkle, I give them a good watering when I do give them any. Of course you can overdo it. But give them a good watering, and do not give them any more until they need it. When the fruit is setting the house needs to be kept as dry as possible. A damp house will interfere with the setting of the fruit.

MR. DELWORTH: Are the paths sunk between these beds, or are they on the level?

A.—I have a twelve inch board for a path, and the bed is raised up to the level of that. The path is about ten inches lower than the soil. I like to keep the bed a little below the top of the board.

MR. DELWORTH: The soil is naturally damp?

A.—Yes.

MR. DELWORTH: What drainage have you?

A.—We have nothing at all, and that is just where we are lacking.

Q.—What is your sub-soil?

A.—Quicksand, the conditions are very poor for growing tomatoes; it has too poor a bottom.

Q.—You have quicksand sub-soil?

A.—Yes.

Q.—And the soil on top of that would be loam?

A.—Yes, quite a sandy loam.

MR. RUSH: The path would act as a drain?

A.—Yes, it drains the bed to a certain extent. Of course, in wet weather in the spring the water gets right up to the path, and it makes it bad for the tomatoes. I believe if you had a place which you could drain well it would give the tomatoes a far better chance. If the house is allowed to get damp it helps along the mildew.

MR. DELWORTH: What do you put on for the mildew?

A.—That is just what I would like to know; we use sulphur. It checks it, but I do not know how to cure it. When the mildew once gets in the best thing you can do is to shove your crop for all it is worth.

MR. DELWORTH: I think where you are heating by steam you get your pipes very much warmer than you do with water. If you heat by steam, I think the sulphur on the pipes will have a considerable effect in checking the mildew. And another thing that might check it would be to sprinkle a little sulphur right on the plant.

MR. RUSH: That would check the growth too?

A.—It might do that too. If you are going to grow tomatoes you should keep your house pretty warm to get the best results from them. I



think the lowest temperature at night should be about 60 degrees. The house should not go below that; and in the day time you should ventilate when you get above 75 degrees. You can go to 85 and 90 degrees; it won't hurt them; but it is well to ventilate when you get above 75 degrees.

Mr. DELWORTH: What system of ventilation have you?

A.—Just Reid's ventilators. When the tomatoes are seeding, I find they need feeding. Tomatoes will stand a lot of feeding. You will find that you will have a job to give them too much. We have used nitrate of soda considerably, but what we like best is good manure water; that is the best food I have used. It will force them along, and if you give them a pretty good dose of manure water once a week it will force them better than anything I know of, and a good dressing of good rotten manure on top of the ground will help them considerably.

Mr. A. McMEANS: What do you do for pollenization?

A.—I have not used anything.

Q.—Would not side ventilation pollenize better?

A.—I think it would.

Mr. GIBBARD, sr.: There is always plenty of fruit seed for summer pollenization, but in winter you want to pollenize.

Mr. DELWORTH: Opening the ventilators will assist in pollenizing. If you want to grow tomatoes you must keep your fires going into the spring. Last year we kept our fires going into middle of June. We could not stop before without injuring our crop. Keep your fires going, and keep your ventilators open and it will keep back the mildew.

Mr. F. F. REEVES: When do you start the harvest?

A.—If the house is kept in proper condition, about the first of June. I heard one man say he liked to get the tomato plants good and big, and then hoe them before he plants them into beds. He says he can get his fruit earlier, and so he can, but he won't get anything like as much of it. I like to see the tomatoes set and well grown up to the top of the plant before they start to ripen. As soon as the tomatoes start to ripen your growth is considerably retarded.

Mr. McMEANS: Are you troubled with the white fly?

A.—Yes. I do not know that they have done much harm. The green fly gives us more trouble than the white fly. If you do not keep your house smoked after you have done cutting lettuce, you will find that the green fly will injure the lettuce.

The CHAIRMAN: Your experience with the fertilizer has been that the liquid manure gives you larger and better results than any chemical fertilizer you have used?

A.—Yes.

Mr. McMEANS: Have you any preference in liquid manure?

A.—I do not know; what I have used has been from the stable. We had one cow.

Mr. McMEANS: Do you use your compost heap and pour water on it, and drain it off for your liquid manure?

A.—The manure pile is in a hollow, and there was so much rain it kept us supplied with manure water.

Mr. ROBERTSON: When your plants are planted out how far are they apart?

A.—Sometimes they will catch up to one another. I have found they would follow on pretty well; they catch up as the weather gets warmer. Last year we finished planting on the 27th of April. The very best yield of

tomatoes we have had are from those planted some time in March. If you can get them all planted in March, I think you would have a better crop.

Q.—About what time do you start marketing?

A.—About the 9th of June.

Mr. F. F. REEVES: In planting out do you plant from each of these lots to give you a succession of fruit?

A.—No, it is just so as to have the plants in proper condition. We do not want any succession of fruit. We want them all off as early as we can get them. You will find that the second and third sowing of seed will give you your fruit quicker than a plant that has been held back.

Mr. J. RUSH: They do not make as rapid growth inside as they would outside?

A.—It is about 90 days before you have ripe fruit. Almost anything will make more rapid growth outside.

A MEMBER: I do not see the advantage of forcing?

A.—We get 15c. a pound for our tomatoes; that is the advantage of forcing.

Mr. E. E. ADAMS: If you expended the same amount of energy and money on the outside growth, would you not have more money at the finish?

A.—No, I do not think so.

Mr. F. F. REEVES: You have not so much work at that time of the year?

A.—The bulk of our work comes in the busy time. If a man has very much out-door work to do he has to be very careful how he goes into glass culture; if you neglect the glass you are better out of it.

Mr. DELWORTH: Unless you follow under-glass-crops right out to their conclusion, and work your house as many months as you can work it, there is no profit. I have never been successful with tomatoes, but I have grown cucumbers.

Mr. GIBBARD: We have ten acres of work outside, and we have all we can do.

Mr. J. RUSH: You say you plant five plants in six feet. What about the plant that is close to the eaves?

A.—My side beds are not so wide and the sills in our house are very low at the sides, and we have put a short lath in. Last year we ran a plant up on the next row. The only trouble was the first bunch was on the ground, and some of them were injured a little.

Mr. J. RUSH: I always incline my laths, I do not run them perpendicular.

A.—You can do that if you like; we run ours perpendicular. (Applause.)

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## FORCING GRAND RAPIDS LETTUCE UNDER GLASS.

BY LUGENE DAVIS, GRAND RAPIDS, MICHIGAN.

The soil mostly used in this section is a fine, light sand, finely manured. It gives good drainage, and never gets hard. Use the best seed obtainable. It should be water cleaned which gives a plump heavy seed, and a more uniform crop. Ventilation should be given at all times when weather permits, but it is well to let cold winds blow directly on the plant.



Watering requires considerable judgment, especially during dull cloudy weather. It is better to water in bright clear weather, and in the forenoon if possible, so the plants will dry off by night. Always water thoroughly when needed. It needs water when the soil taken in the hand will not pack but crumble.

For aphids or green fly, fumigate twice a week with tobacco stems, or use tobacco dust sprinkled on plants and ground. Use after each watering until plants are one-third grown; if put on full grown plants it is very difficult to wash off. It is better also not to fumigate when the crop is nearly ready to sell, as it will smell and taste of the tobacco. We carry a night temperature of 45 to 50 degrees, day 60 to 75 degrees. We have a self-registering thermometer and thermostat, with electric bell in dwelling house. It pays, as some firemen are careless about keeping an even temperature at nights. We get better results in starting the seed bed under glass even in August when seed is sown for first crop.

Plants are not so apt to get brown rooted or rusty, with which there has been very much trouble here, in the past three years. The rust is known locally as "shot-hole" rust, as the leaves are eaten full of holes. The crop is often completely ruined. The Michigan Experiment Station at Lansing will issue a bulletin this winter telling all that is known about this disease. For fertilizers livery stable manure, partly rotted, or in a short condition, is used. If run through a manure spreader it is in fine condition to mix with the soil. My houses are 29 by 280 feet, with double doors in each end, so that the soil and manure can be drawn in with a team and wagon. In preparing for a crop, two inches of the top soil is shovelled one side, then four inches of manure is evenly spread; then with a horse and plow is thoroughly mixed, leveled off, well watered, and top soil replaced. Eight inch boards are used for walks, which practically gives all the space for the crop. This is all the fertilizer used for the three crops usually grown during the season. It is planted in rows six inches each way, with double rooted plants six weeks old. The crop is usually ready for market in seven to eight weeks. It is sold by the pound, and packed in sugar barrels and bushel baskets paper lined. Competition is keen, and prices vary. They usually average 8 to 12 cents a pound for the season. For the past three years, instead of changing the soil, we have sterilized it with steam. It is less work, renews the soil, makes the crop grow faster, prevents damping off, kills weeds and insects, and I think it will pay any one who is having trouble in growing lettuce to try it.

The CHAIRMAN: There is one point there; sterilizing the soil.

Mr. MCMEANS: They all sterilize in Boston. When I was there I saw them doing it. They use a big box and they get a temperature of 212 degrees; but now they use an adjustment something like a harrow, and have a pipe about twelve inches long, and it is connected on the top with a pipe that is connected with the steam boiler. It is plunged into the soil, and is left there about an hour with the steam turned on all the time, and they tell me it makes a week's difference in the growth of the lettuce, having the soil sterilized.

Mr. DELWORTH: I think these men at Grand Rapids are using the same system as they do at Montreal. They produce a different lettuce to what we do. Just outside of Montreal they grow it in about the same system. They get lettuce about sixteen inches high, and they grow a head of lettuce that would weigh several pounds. They have a house 200 feet long. Mr. Garry told me he was getting 80c. a dozen, and we were selling our lettuce at the same time for 20c. a dozen.

Mr. McMEANS: I always grow my lettuce about six inches apart, and I always sell it for 75c. and 80c. a dozen, when it would be selling in Toronto for 30c. It takes two weeks longer to get it there, but we are getting three times the price, and can get three crops in a season.

Mr. DELWORTH: I can back up what Mr. McMeans says about lettuce. Mr. R. McRoberts was handling lettuce that came from Brantford from Mr. McMeans, and he was selling it here in Toronto for 75c. and 80c. a dozen, and I was offering my own for 25c.

Mr. RUSH: Mr. Cole, of London, produces fine lettuce, and it is sold at 80c. a dozen. Twelve dozen fill a big sugar barrel.

Mr. BUSHEL: That is a matter that ought to be dealt with, the size of a bunch of lettuce. Our people in Kingston saw lettuce advertised for 20c. in Toronto, and we were charging 50c., and in order to satisfy these people I wrote to White & Co., of Toronto, to send me down a dozen of lettuce and a dozen of parsley and it took four bunches to make one of ours, and I could not give it away. I thus showed the people that we were not thieves in Kingston, and I think there should be some regulation that a bunch should be a certain size.

A MEMBER: This Grand Rapids lettuce is the result of fourteen years selection of Black Seeded Simpson.

Mr. McMEANS: The best lettuce grown in America is grown near Boston, and their houses are fifteen feet high on the ridge, and the lettuce is planted on the ground.

Mr. DELWORTH: In Montreal their houses are over fifteen feet high.

Mr. McMEANS: I built a house some years ago on the ground; it was about fifteen feet at the ridge. I could not produce as good lettuce on the south side of that house where it is near the glass as I can in the middle, and never could.

## FERTILIZERS IN RELATION TO VEGETABLE GROWING.

By PROF. R. HARCOURT, O.A.C., GUELPH.

I hardly knew what to take up at this meeting, and, therefore, have not prepared a special paper, because I thought I might happen to get away altogether from the line of work most wanted. I am, therefore, going to talk on the subject and allow you full permission to break in and ask questions whenever you like.

First, I will say something with reference to the plant and the soil, and then I will speak with regard to fertilizers, and their relation to the plant. We should bear in mind that, in dealing with the young plant, we are dealing with something that needs everything, practically, that the young animal requires. The seed contains within itself the food for the young plants. Just as it starts out for itself, after the food in the seed is used up, and just as it begins to feel out for food from the soil, is the critical time with a great many plants. At that time the plant requires moisture, air and sunshine, food and warmth, just the same things that a young animal requires. The plant breathes and has respiration. It will give off carbon dioxide just the same as an animal. It has not the same power of getting its food that an animal has. The animal can hunt around for its food; the plant cannot change its position. The plant has no way of calling attention to its needs as the animal has other than by



its appearance. A man who is skilled in his work can detect what is lacking in a plant, or lacking in the food supply for that plant. I think it would aid us a good deal if we would think of plants as requiring the same thing as animals;—that it requires food, warmth, and moisture in its home, which is the soil. The roots of the plant must breathe, and that means that the soil must be open and porous so that the air may get through; and in order that the roots may have a chance to spread out, the soil must be in such a condition that it will hold moisture, and it must contain the required amount of food. Our soils are not all of that condition. We have soils of various depths. Soils, of which the plant foods are not broken down to the condition where they are readily available for the plant, and that is one of the great objects of cultivation, simply that we may break down the inorganic substances, and bring these into the condition that the plant may make use of them, and that we may open up the soil so that there will be air in the soil for the plant to breathe. We can no more grow a good plant in the soil without opening it up than we could grow a good animal in a close, tight barn. We must give the plant the same conditions that we would the animal.

We know that the plants take up a number of different constituents from the soil, that they have the power of selecting the various substances from that soil, and that they have power to take into solution certain things that are in the soil. There are only some three or four constituents that are likely to be deficient in the ordinary soils. We have a number of soils, of course, that may require a larger number of constituents than that. In most of our soils it is potash, phosphoric acid, nitrogen, and lime that is particularly required, not for the soil's sake but for the plant's sake. Potash, nitrogen, or phosphoric acid are food substances, and just as essential to that plant's life as the different substances that we may take into our own bodies. The plant has got to have these or it cannot make the growth. More than that, while we may have some of all these different constituents present, the plant must have a balanced ration. There must be a proper arrangement of all these different substances in order to make proper growth, so that the plant requires a balanced ration just the same as an animal requires a balanced ration. We recognize the fact that if we are going to grow a young animal we will feed that animal differently if we want to produce a full grown animal or an animal that we want for the production of milk. There are plants that require feed in different ways according to the product we want to get from that plant. It is like a chain, which is just as strong as its weakest link. The question is, how are we going to get these different constituents. There are a great variety of sources. Fifty years ago some of these substances were comparatively scarce. It is not fifty years ago since, in the neighborhood of Boston, they used to pay as much as fifty cents a bushel for Canadian ashes, and we were quite content to let them go from this country at five cents a bushel.

The supply of these food substances is not the only point that is to be taken into consideration. Before one can use artificial fertilizers, in any intelligent way, they must know something of the needs of the plant which they are trying to grow, what they wish to get from that plant, and what is required. Some plants will take one constituent from the ground readily, while another plant will have difficulty in utilizing that constituent. We, therefore, must know the power of the different crops to get their plant food from the soil. For instance, we do not want to apply a large amount of nitrogen which forces the leaf and stem growth of the plant. If we are

looking for a small amount of stem and leaf, and a large amount of fruit, then we must know something about the needs of the soil itself. Some soils contain a great many times more potash than other soils. Some soils may contain a good deal of it in available form, others may contain a small quantity of it, and that not in a form immediately available for plant food. Foods differ widely in the agents which are at work, and we must know and understand the fertilizers that we use before we can hope to use them intelligently. To a great many people a fertilizer is a fertilizer no matter what it contains. I know that there are a great many people who buy a fertilizer, and that is all they know about it. Just the same as some people buy potatoes and cannot distinguish one variety from another. We may have nitrogen in a fertilizer in a form that will break down quickly, and we may have nitrogen in a fertilizer that is got from woollen waste or litter, or hair, which will take a long time to come into available condition.

There are a great many things that the growers should know something about, and that are hard to get at. We must make the soil as congenial to the plant as we possibly can by methods of cultivation, and by selecting plants that are suitable to the soil.

Where we want strong leaf and stem growth, abundance of nitrogenous manure may be used without any fear of harm. A large amount of that may be used, because you are forcing a large growth. Where quality depends upon the crispness, and crispness depends on the rapidity of the growth, you can use abundance of manure, but always, of course, with a good supply of the other substances to carry on the growth. If we want a plant to ripen, or to bring fruit, such as the tomato, then we must keep back the nitrogen, because we want the fruit to come and the fruit is always associated with phosphoric acid and potash. There is always a difference in the way in which we would use fertilizers for these two different growths. Farmyard manure, of course, must always stand as a basis. Nobody would for a moment think of advocating that the farmyard manure be done away with, but farmyard manure is not a balanced food for all plants. It is essentially a nitrogenous manure and the use of large quantities of that will always mean that we will grow a large amount of leaf and stem. Large quantities of that manure would not be what we require for growth of crops that have to be ripened. Scientific research, the world over, has proven the fact that barnyard manure is used at a loss where there is a large application, because there is always a loss of the nitrogen, the most available substance in the manure. Experiments conducted in the Old Country have demonstrated the fact that smaller quantities of barnyard manure, backed up by the particular constituents required by the crop grown, applied in some soluble form, will give more economical results—will give healthier growth and all around better growth—than the use of too large quantities of barnyard manure.

MR. ROBERTSON: As you know, I conducted some experiments with potash in growing potatoes, and I would like to ask how long does this phosphoric acid and potash last in the soil?

PROF. HARCOURT: There is practically no loss in the potash and phosphoric acid applied to the soil. You may add potash or phosphoric acid without fear of much loss. On the other hand nitrogen will be very quickly lost. Fertilizers should be applied long enough ahead to allow of their being fully diffused throughout the ground so that the plants may get it. All the experimental work we have done has been weak because we had not a chance to get the fertilizer on the soil long enough ahead. The poor re-



sults with the potatoes was due to the fact that there might not have been enough nitrogen there to give good growth.

Mr. ROBERTSON: There was good top growth.

Prof. HARCOURT: You got results the next year?

Mr. ROBERTSON: Yes; there was apparently little difference between the phosphoric acid and potash, and the phosphoric acid, potash and nitrogen. I would like to ask Mr. Rush if he could get much of these garbage ashes?

Mr. RUSH: Yes, there is about twenty tons of it thrown out. It requires a little wire pulling to get it.

Prof. HARCOURT: I value them at pretty nearly the same as ordinary wood ashes.

Mr. ROBERTSON: What do you value wood ashes at?

Prof. HARCOURT: About  $1\frac{1}{2}$  per cent. phosphoric acid, and from 1 to 5 or 6 per cent. of potash, and the lime from 30 to 40 per cent. This garbage ash Mr. Rush sent up would contain nearly 2 per cent. of phosphoric acid and about  $2\frac{1}{2}$  per cent. of potash, and a little over 8 per cent. of lime. With  $1\frac{1}{2}$  per cent. of phosphoric acid and  $2\frac{1}{2}$  per cent. of potash, they are worth about 5 cents a lb. and twenty hundred weight in the ton, that would be \$1.50 for the phosphoric acid and \$2.50 for the potash. It would be \$4 a ton without saying anything about the value of the lime; and, where you are using such large quantities of farm-yard manure I think the use of that substance would be a good deal of value.

Mr. RUSH: I do not think that these ashes would contain the same quantity of phosphoric acid. Sometimes there is so much more bone collected.

Prof. HARCOURT: There is no doubt the garbage ash would vary.

Mr. ARMSTRONG: We tried that garbage ash fifteen years ago. The wood ash is altogether ahead of that.

Mr. JACKSON: Which is the best, hard wood ash or soft wood?

Prof. HARCOURT: I think, take it in every way, ashes are about alike. Hard wood makes a heavier ash. There would not be so much bulk a pound as for the lighter woods. A great deal depends upon the position of the wood in the tree. That from the limbs and branches will contain more potash than that from the trunk of the tree, and the limbs more than the twigs. As you pass upward you get more potash than you do from the root of the tree.

Mr. F. F. REEVES: Have you had any opportunity of testing the advantages of fertilizers as relating to green house crops, lettuce, and radishes?

Prof. HARCOURT: No, I have no experience of that whatever, but I can say, from the nature of the growth, what is generally required for a crop of that nature. You could give it a considerable quantity of nitrogenous manure to get the growth.

Q.—How would that best be put on, dissolved in water or mixed with the soil?

A.—I think it might be either way. I never would put on large quantities of it at once, give it a little at a time.

Mr. F. F. REEVES: I saw a patch last winter that had nitrate of soda applied to it; I think at the rate of a teaspoonful to two gallons of water, and that was applied about every ten days. It was not put on the leaf, but was worked into the soil, and a blind man could tell the difference on that patch of lettuce in the extra growth; and the part of the greenhouse,

where that was applied was cut ten days earlier than the other part. They had both good cultivation and the same soil.

Prof. HARCOURT: That is the point I want to make with reference to these crops. That is the nature of the crop that will stand nitrogen, and you will not get the best results by putting in a large amount to commence with.

Mr. F. F. REEVES: When this method was started the lettuce was about half grown, and the lettuce was better in every way, stronger and heavier lettuce. They were planted on a raised bench.

Mr. W. A. BROUGHTON, Sarnia: How would you apply the wood ashes?

Prof. HARCOURT: You can apply them whenever it suits your convenience. There is no danger of it bleaching from the soil to any great extent; therefore, I do not think it makes a great deal of difference.

Q.—Would harrowing do as well in every way?

A.—I would never think of plowing them down. They work themselves down into the soil quick enough, and all that is wanted is a harrow.

Q.—Would it do to put them into a drill with the potatoes?

A.—No, I would rather broadcast them. I think it is better to broadcast, them because the roots reach out into the soil.

Mr. MCMEANS: Gregory, of Massachusetts, advocates putting 250 bushels on an acre.

Prof. HARCOURT: When you put them on as heavy as that you may have to use a plow. A ton of ashes would contain 100 lbs. of potash, and that is a very fair application of potash for ordinary crops; that is a fair application to the acre. I do not believe in too heavy an application of ashes, more on account of the lime than anything else. Lime is practically a stimulant. It has some very beneficial actions on the soil and especially on soil that is heavily loaded with organic matter. The plant itself requires a certain amount of lime, and there are lots of soils that may have plenty, and you are only adding the lime and liberating potash in that soil, and allowing it to be backed away, so that too much application of lime would be injurious. That is one reason why I would rather see ashes applied in fairly measured quantities. I have seen the result of potash no more distinguished than on Mr. Heard's place at Burlington this spring. Where potash was not applied to the radishes they were hardly saleable, and where it was applied he had fine large radishes, and of good quality; and it was the same through almost every part of his ground. Mr. Heard can go to work and use potash on that field without any fear of losing money, because his ground requires it. No man can go to work and use fertilizers successfully until he has demonstrated, by some such means, what is needed for his particular soil and his crop.

Q.—Don't you think he would soon exhaust the supply of ashes.

Prof. HARCOURT: That is what happened fifty years ago when the Boston vegetable growers paid fifty cents a bushel. Since then the big mines in Germany are turning out thousands of tons of the mineral potash. No matter how careful things are husbanded there is a certain amount of fertility going away in the water, and so it is lost. It is now coming back to us in the mineral forms, which, by chemical means, are now brought into condition. We have in the atmosphere an immense supply of nitrogen which is being thrown open for the growth of plants.

Mr. RUSH: Is it not possible to apply too much potash for radish growing? I put radish seed in this garbage ash, and they have germinated, but there is too much potash for them.



Prof. HARCOURT: Plants have got different needs altogether just the same as animals or children require different treatment. To get the very best out of fertilizers you have got to understand your soil and the nature of the fertilizer you are using.

Mr. DELWORTH: With mineral potash is an article offered as kainit?

Prof. HARCOURT: Yes, that is in the crude form. I think the ashes would be better than the other. It may be that you cannot get enough of ashes.

Mr. DELWORTH: A very heavy application of stable manure may be conducive of loss, because we supply too much nitrogen in proportion as the other elements that are required.

Prof. HARCOURT: I think so, and I am not surprised that our fertilizer experiments in this section were a failure this year. In only one case was there a decidedly good result from these fertilizers. At first, when I was given the names of those willing to co-operate in the work, I wrote to every one asking them something about the nature of the soil, and, when I got answers to the letters saying that they were plowing under 100 tons of manure every year, or they were plowing manure as thick as they could get it into the furrow, I thought I might save myself the trouble of sending in artificial fertilizers to that section. That soil must be loaded with plant food, and, in many cases, this applied upon low black soils that are rich in nitrogen.

The CHAIRMAN: Don't you think lime would be a good thing for our soils?

Prof. HARCOURT: I would rather experiment with lime alone for your soils.

Mr. ARMSTRONG: What about carbonate of lime; they claim there is a percentage of lime in that, and it could be bought for \$1 a ton.

Prof. HARCOURT: If you could buy carbonate of lime, ground, fine for \$1 a ton, and if it is not very far to haul, there are sections through here where it would pay to put some of it on. The difference between carbonate of lime and the lime is that it has been burnt or heated until the carbon dioxide has been burnt away and left the quick lime in its place. On your soils that could be quickly broken down, and would be taken into solution the same as we have had in drinking water.

Mr. F. F. REEVES: Take that celery land; you went through that. What would you think would be a fair dose to give it of quick lime, ordinary brown air-slacked lime?

Prof. HARCOURT: I do not think I would advocate the use of more than about a ton and a half for the first application, and rather apply in three or four years' time. That is better than giving a heavy application.

Mr. F. F. REEVES: A few years ago there was a lot of gas lime hauled out our way.

Prof. HARCOURT: Gas lime at first applied would contain injurious salts, and it would rather destroy the growth than otherwise. After it has been exposed for some time, charges takes place, and the injurious substances are destroyed, and then it would have some value; but it would never have a value equal to the slacked lime.

Mr. RUSH: You saw those beds where I applied the gas lime; 28 years ago nothing would grow there. I even planted squash there, and they would not grow.

Mr. DELWORTH: Muck lands are deficient in lime.

Prof. HARCOURT: Yes; the longer the land is under cultivation, and the more organic matter is worked into that soil, the quicker they will become deficient in salt. I do not care how rich it may have been in the first place. As a result of the decomposition carbon dioxid is formed. That acts upon the lime and it is drained away out of the soil. That is the reason water is hard, and that is why our river waters run hard in a great many cases.

Q.—Is there a simple way of testing the soil to know whether it needs lime or not?

A.—Perhaps one of the simplest ways of testing is to get a piece of blue litmus paper and just put it into the damp soil, and allow it to stand there for some time and if that paper turns red, you may with great assurance apply lime to that soil.

Q.—How long would you leave it there?

A.—A half hour.

Mr. ARMSTRONG: Have we got in Canada that carbonate of lime in mineral form?

A.—Lots of it. All the lime stone that is used in building foundations and brick work is carbonate lime.

Mr. ARMSTRONG: It is carbonate of lime they are selling in Louisiana. They claim it contains 99% of lime; is that equal to the same lime we get in wood ashes?

A.—The wood ashes is just as good as the other, and the carbonate of lime that you will get out of your own lime stone rock will be as good as the lime stone rock from Louisiana. Down through Louisiana they have a great deal of this calcium phosphate, which is being commonly made into superphosphate and a great many are advocating the use of that; but I would not advise any of you men to buy one pound of superphosphate. I would not pay the extra price. It would be better to buy ground phosphate and allow the excess of carbon dioxid that you are bound to have in your soil to do the solution for you.

I would like to make another point in connection with last year's fertilizer experiments. After visiting the plots, I was afraid that possibly the superphosphate was doing too much to the soil, and that might have checked the crop as much as anything else. I would try phosphate or basic phosphate substance rather than superphosphate on the nature of soil that you have here near Toronto.

Q.—Which would you consider the cheapest source of phosphoric acid, ground bone or this mineral?

A.—I think possibly the ground mineral fertilizer would be the cheapest source of phosphoric acid. Of course that powdered up bone is very rich in phosphoric acid. It will contain as high as 30 per cent., whereas the superphosphate would contain about half that amount. Straight ground bone would contain twice as much phosphoric acid as superphosphate, and for land around Toronto would be twice as valuable as superphosphate. I think, on the ordinary crops, you could afford to pay pretty nearly twice as much for the ground bone as you would for superphosphate.

A MEMBER: I buy Armour's pure ground bone for \$30 a ton.

Mr. RUSH: Would you advise the ordinary gardener around Toronto not to buy these artificial manures. There are men in this room who pay \$60 a year for this Bradley Fertilizer, and I think if they are wise they will save that money next year, and buy a few tons of lime and have better results.

Prof. HARCOURT: I rather think they would if it is on such soil as I visited. Bradley fertilizers are good fertilizers, and in most of them the



nitrogen is in an available form, but whether there is a mixture there, of these substances in the proportion you want is another thing.

Q.—You do not believe in buying mixed fertilizers?

A.—I certainly would not for such ground as I visited in this section. I would say, try a little lime this year and see what you can get from it, and let that guide you as to future work.

Mr. McCALLA: Spinach is a crop that requires plenty of lime. I grew an acre of spinach last year, and I gave it a dressing of air slacked lime and put on Bradley's mixed fertilizer, and I got off the piece that had Bradley's fertilizer and manure, ten tons to the acre, and the piece that had lime was not worth cutting at all, and on the heavier parts of that land it was about half a crop. So that the last advice which Professor Harcourt gave us will have to be taken cautiously, and we should not jump from the fertilizer to the lime.

Mr. F. F. REEVES: Your land is far different to ours?

A MEMBER: The land around this district is composed principally of sand.

Prof. HARCOURT: The part I visited was hills between re-claimed swamps.

A MEMBER: We have heavy clay, and as far as stable manure is concerned we get it for the hauling, and our land is pretty well full of manure.

Prof. HARCOURT: You cannot do as well in clay land unless it was opened up with farm yard manure, and I do not care whether it is clay land or what it is, no soil will give good results unless there is an amount of decaying organic matter present to give it that openness of texture. Lime will have good results on clay soil. It has a stimulant action, and it will liberate potash from the clay substances. Clay is usually rich in potash. Lime will improve the condition of the clay soil. I would advise you to try some lime, about one ton and a half to the acre.

Mr. RUSH: Would clover plowed under be equal to barn yard manure?

Prof. HARCOURT: Whenever you can get clover to grow, and you can spare the time to attend to it, I would certainly grow clover, because that is one of the plants which will bring back nitrogen out of the atmosphere, and through its long roots it will bring up substances from the sub-soil.

Q.—When is the best time to plow down the clover? I had a piece this spring, and it has made good growth.

A.—I do not know as it would make any difference whether you plowed that this fall or next spring. It has got everything it is going to have. It depends on how soon you get the crop on it next spring. I would not like to say that lime would give results on any soil; for instance you have the example Mr. McCalla has given. There was soil that was benefited by direct application of plant food.

Mr. ARMSTRONG: Where you want to use potash and lime what would you suggest as being the cheapest commercial article for that purpose?

Prof. HARCOURT: If you can get ashes you may be able to get potash cheaper in the ashes than you would in any other way. I think you would have to take into consideration the greater bulk of substance you would be handling and the distance you would have to haul it. Muriate of potash will contain about half a pound of pure potash, and 100 pounds of the ashes will not contain more than about five pounds of potash, so that one contains about ten times as much potash as the other, and one is in about as good form for ordinary crops as the other. There are some crops that will be injured by muriate of potash. For instance you should use muriate of potash

on tobacco, and where crops are being grown for wine they do not care to have muriate of potash.

Q.—Why is that?

A.—Because of its effect on the ash; the tobacco does not burn free; and in the grapes it has an action on the sugars. In sugar beets it prevents crystallization and the extraction of the sugar. For ordinary vegetables it would not make any difference.

Mr. RUSH: I draw the refuse from the wine press at the Lees Wine place.

Prof. HARCOURT: The most valuable constituent there would be potash.

Q.—Does it give you any result?

Mr. RUSH: I do not know; we pitch it on pretty heavy, we put it in the pig yard.

A.—That would tend to make your soil acidy.

Mr. McMEANS: Would there be any difference on potatoes between muriate of potash and ordinary potash?

A.—Yes, the sulphate makes nicer flavored potatoes than the muriate.

Mr. ROBERTSON: What success have the chemists had in taking the nitrogen from the air by chemical processes.

Prof. HARCOURT: There is a substance calcium cyanamide, which is being experimented with somewhat in England and Germany with very good results. It is stated that it is equal to nitrate of soda as a fertilizer. It is got by taking and heating calcium carbide in the atmosphere at a high temperature.

Mr. DELWORTH: Have any experiments been conducted with nitro-culture?

Prof. HARCOURT: A great deal of it is being sent out for different forms or clovers, but I think as a rule you will find that in Ontario our soils are fairly well inoculated with the germs necessary for that work. There are some places where the soil is not inoculated for lucerne.

Prof. HARCOURT: We have a Fertilizer Act in this country that protects the gardener in the purchase of fertilizers. The law says that any fertilizer sold at more than \$10 a ton must be sold per guarantee, and you can demand the composition of any fertilizer that you are buying and paying more than \$10 a ton for. In looking over the last report of the Inland Revenue Department, I noticed there were 42 different fertilizers sold in this Province, and 17 of these were unregistered, which means that there were 17 samples sold contrary to law.

Mr. DELWORTH: I have understood that according to our law they have to guarantee the analysis, and there the matter rests; if it does not come up to the guarantee what are you going to do about it. A law suit is our only redress, and therefore, the law is not much use to us.

Prof. HARCOURT: Every man who is selling a fertilizer at more than \$10 a ton has to send a sample to Ottawa, and they analyze it, and they may use that analysis as a guarantee. The Government sends men around to collect samples of that brand, and they analyze those samples to see if they come up to the standard.

A MEMBER: Suppose I bought a car load of ashes and they were shipped in an open car, and if it rained when they were in the car would I lose anything?

A.—Not unless there was sufficient to make drainage through the car. If there was no water leaking away you would not lose anything, and if there was water leaking away you would.



## FORCING OF EARLY VEGETABLES.

BY E. E. ADAMS, LEAMINGTON.

The forcing of early vegetables, has become a business of considerable magnitude. Not only in our country, but in the United States, large glass houses are being built for this purpose alone, and a person may well ask the question "Does it pay? and if so, can I hope to succeed at the business?" Many have gone into this business with little or no knowledge of the care and attention which it demands. Many failures have occurred, and will occur as long as man's incapacity lasts. Speaking of my own experience, I may say that I have not grown a general list of vegetables either under glass or in field. My own work or business has been the growing for early market the following fruits or vegetables:—Tomatoes, peppers, cabbage, beans, muskmelons, and sweet corn. These are all grown in the field, not forced under glass. Tomatoes, peppers, melons, cucumbers, and cabbage plants are, of course, started under glass, not in hot-beds, but in glass houses, heated by steam.

Tomato and cucumber seeds are sown in moderately rich soil in flats the latter part of February. Tomato plants are pricked out into other soil in about two or three weeks, being given at this time a soil space of about 4x6 inches, and then again moved the latter part of April or first week in May into veneer sections 5x5x5 inches with no bottoms, or, they can be moved into flats, for convenience in handling. The flats which I am using are 12x22 inches inside, and 5 inches deep. These flats are placed upon the benches, and the plants grown to the desired size, and then moved out in beds either dug in the ground, or built above ground with lumber and covered with cotton. I put eight plants to each tray. This cotton cover is for the purpose of keeping cold winds off the plants, and also to assist in hardening the plants, before being set out in the field.

I prefer to water thoroughly, being careful to see that all portions of the bench soil or flats are evenly done. Water is run on with a half-inch hose with no nozzle, not with heavy pressure, but gently. When planting out time comes, usually about the 18th or 20th of May, it is found very convenient to handle the flats into our waggon, sending them to the field quickly. In preparing the soil for growing these plants in the houses, I usually pile up sods, taking them from either sandy or clay loam fields, and pile up with alternate layers of fresh horse-manure, letting this stand over winter and cutting up fine as early in the spring as possible. This gives a soil containing a large amount of fibre; it does not dry out quickly, and in decomposing feeds the plants for a considerable time. The soil for field culture, should be fairly rich in humus, clover or well decayed manure being turned under in the fall. Either of these will be well incorporated in the soil by the following May.

Before setting in the field after plowing my soil, which is a light sand, and after using the disk and smoothing harrows, it is well to mark out nice and straight rows, and plow furrows about five inches deep, in which the plants may be placed after being cut from the flats carefully, giving them three and one-half feet in the row, and rows five feet apart. These furrows may be filled in at once by a man or boy following up with a hoe and drawing the soil around the plants. Or, some may prefer to mark out their land both ways according to their own notion, and dig the holes with a spade. That is a matter of personal taste. As soon as planting is all done,

nitrate of soda is applied around each plant, care being exercised, that none of the soda is put on the plant, for where it is so left it will burn them. This should be avoided on general principles, for the nicer and more carefully we can do our work, the more profit and pleasure we will get out of it. I always use one ounce of soda, sprinkled around each plant, and when it is all on, the tooth cultivator is put on, and the ground cultivated both ways, to mix the soda in thoroughly. Cultivation is practised twice each week, first one way, then the other. Not much hoeing is required if cultivating is done carefully. I generally hoe but once, although no set rule will apply on that part of the question. I have applied, as a test, two applications of soda, to find out if it will increase the crop, and I find that there is little if any advantage in that.

As to fertilizers:—I am of the opinion that with South American Guano, which contains 3 per cent. nitrogen,  $2\frac{1}{2}$  to 3 per cent. potash, and about 18 per cent. phosphoric acid, built up with sulphate of potash, so that we will have perhaps from 6 to 8 per cent. of that ingredient, we would then have a very good, efficient, and safe fertilizer to use. I used this on a portion of my crop this year, with no barn-yard manure, and had very nice smooth fruit, and a liberal supply. But, on another portion of the crop, I used well decayed barn-manure with an ounce of soda to the plant, and picked during the fruiting season continuously from this lot, and at the last picking about the 20th of August, I picked an eleven quart basket of as fine fruit as I had at any time during the season. Further tests will have to be made, to determine just what fertilizers are the best and most profitable to use on tomatoes.

The next thing you do after you get a good crop of tomatoes, is to sell them for a big price, if possible. Cabbage is started under glass, and moved on flats, giving it about 3x3 inches space, and watered once a week with manure water to which has been added about two to three pounds of guano and one pound of soda. If they need further watering during the week, give them clear water alone. Cabbage is a gross feeder, and plenty of nitrogen should be given to make good strong plants, and I am fully of the impression that from a week to ten days can be gained in earliness of the crop, if the plants are strong to begin with in the field. The soil should be very rich, and well cultivated and conditioned before planting, and immediately after planting, soda should be applied around each plant to the amount of at least  $\frac{1}{2}$  an ounce, and hoed or cultivated in with a fine-toothed cultivator. In the course of a week, I generally sprinkle soda in the rows again around the plants, but a little further away from the stem—about the same quantity of soda. Again, about the 1st of June, another sprinkling of about 200 pounds to the acre is made in the centre of the rows and cultivated in at once, or the cultivating may be omitted if a shower is on when applying. This will dissolve the soda, and carry it to the roots quickly. I have some experiments with commercial fertilizers, this season, and am not satisfied that they are a profitable article to use. One plot,  $\frac{1}{20}$ th of an acre, was planted with no fertilizer, another plot, same size, was fertilized with 400 pounds of acid phosphate, and 200 pounds soda, the soda being given in two applications; and another plot was given 160 pounds muriate of potash, 400 pounds acid phosphate and 200 pounds soda, per acre. The plot given no fertilizer, was very poor; the plot given soda and phosphate was about 40 per cent. better, and that given soda potash and phosphate was 50 per cent. better than where none was used, but that portion of the crop upon which I used barnyard manure (a very light coating being given), but with the addition of about 500 pounds of soda to the acre, was about 30 per cent.



better still. Apparently, this would show that manure and soda are very satisfactory and profitable.

In 1905 my early cabbage was the finest that I ever grew, the variety being Early Jersey Wakefield. No manure was used that year, but a light coating was used the previous season for a melon crop, and before planting the cabbage, a sowing of guano was made and the soil harrowed several times to thoroughly mix or pulverize it. The plants were put in rows three feet apart and two feet in the row. Nitrate of soda was sown in the rows and cultivated, and in ten days another sowing was made during a light shower. These last mentioned sowings would amount to about 150 pounds an acre at each sowing. This cabbage crop was very fine, and sold for good money.

Cucumbers and muskmelons are started under glass, the seed being sown in flats, and when in the third leaf are moved into other flats or pots as desired. The soil for these pots is composed of good garden soil with the addition of about one third its bulk of well rotted horse manure droppings well mixed. Careful watering is required in order to keep up a steady and uniform growth. At planting time the pots are full of roots, and ready to grow without interruption, weather conditions being favorable. I plant to the field about June the 10th. The soil should have had a good coating of well rotted manure, or a clover crop turned under, and well harrowed down. Growth can be forced by the application of one ounce of soda well worked into the soil around, but not close to the plant.

I have grown some tomatoes under glass, having grown Earlibell, Earliana, Magnus, Burpee's Combination, and Dwarf Champion. These were about 12 inches high at planting time (May 10th), and began fruiting July 1st. The Earlibell and Earliana were the best varieties for that season (1905). I have not grown any during the winter months. Lettuce is grown for a fall crop, and is all off before Christmas, and is sold by the pound, 15 cents being the price I get for it. It is, or has been grown on ground beds, but I have some now on benches which is growing well so far this fall. I can see no difference yet. I generally sell, when the plants run from six to eight ounces in weight, which make very fair looking lettuce.

I have grown cucumbers under glass, and have found the Perfection Hot-House to be about the best I have grown, on account of fine size, color, and flavor. For fertilizers in the greenhouse, I use well rotted manure worked into the soil, and as far as I can see at present, I prefer guano as a top dressing, and also a good addition to the manure water barrel at fruiting time. Two pounds of guano are added to 40 gallons of water, and about a bushel of fresh stable manure is put in a bag into the barrel. This makes a very rich manure water, and gives a good color and vigor to the plants. It is advisable to thin out the growth somewhat, as generally there is too much vine, and I think plenty of light is advisable, and by thinning out the sun can get in and not permit of the house being too damp. I am of the impression that they do not fertilize well, unless the atmosphere is somewhat dry, to permit of the pollen in the blossoms becoming in proper condition for doing it's best work. The only disease, if it can be called so, is a splitting of the vine at the surface of the ground. I have examined several plants so affected, and have found a little fine worm white in color, and about 3-8 inch long. This is, or may be the larva of the cucumber beetle, but I am not certain.

Some growers claim that plants should be planted well above the surface of the soil to permit of good drainage, and that this will prevent the vines from splitting, they claiming that too much water causes the corrod-

ing or splitting. This may be so, but, that will not do away with the little worm in question. Tobacco dust is said to be a good material to put around the plants to prevent the beetle from working, but I think that the regular Bordeaux mixture will do much better, this being used largely for field work. Constant care and attention is required in growing cucumbers as well as melons in the field, in order to prevent blight. They must be sprayed almost at once when put in the field, and for best results, should receive applications about every ten days; or in other words, keep the plants if possible, constantly covered with the spraying material, and there is a fair measure of success in sight.

I have tried radishes under glass in the spring months, having used the Long Scarlet, Early Scarlet, Turnip, and Burpee's Hailstone. The Long variety was a complete failure. The Hailstone was the best. It is white, and very crisp and solid. Never having grown or tried to grow them before, I did not meet with success, and am open for advice. As an amateur, along with others in our country, I am endeavoring to find out from others, as well as to work out for myself some of the problems that we run against. As to the question of profit, I have as yet been unable to get at some facts that are essential for a person to know before treading too far into the work, for the question of cost must be considered by every grower. If the cost is too great, then we must call a halt. The work has its compensations, however, even if no large returns are made from it. It is a great satisfaction to see plants grow right, as well as to reap the crop. Pleasure and profit are a good combination.

Mr. HILBORN: Are you troubled with blight on the tomato?

A.—Yes, we are, but I do not do anything to prevent it.

Mr. ROBERTSON: Have you sun-scald on tomatoes?

A.—Yes.

Q.—What do you do to prevent it?

A.—Nothing. The largest amount of sun-scald we get in the field where it is close by a hedge or where there is not sufficient circulation of air. Out in the field, where there is a free circulation of air, I do not know that I have found a tomato that was scalded.

Q.—Will you spray some of your early plants with Bordeaux mixture, and leave the others, and I will do the same and report on it next year?

A.—Yes.

Mr. ROBERTSON: I believe that the cause is mildew, and I believe the Bordeaux mixture will control it. I have one end of my field near a bush and that is where I get the mildew.

Mr. CHAIRMAN: Do you think that the Bordeaux mixture will check the mildew?

Mr. ROBERTSON: I am positive that the Bordeaux mixture is beneficial in all fungous diseases. I do not say that we can kill it, but we can prevent it.

A MEMBER: Sulphur and lime is better for onions than the Bordeaux mixture.

Mr. DELWORTH: What kind of soil do you grow your tomatoes in?

A.—A light sand.

Q.—What kind of sub-soil?

A.—Just sand down as far as you can go. My well is 45 feet to the water, and we get our water in a quick sand.

Q.—What rule do you adopt in thinning out your cucumbers?

A.—We cut off all the shoots two feet above the ground; we train them up on hinder twine made in the form of a Page wire fence.



## ONION GROWING.

BY E. G. MALCOLM, SCOTLAND.

When I received an invitation to speak upon onion culture at this meeting, I hesitated for some time to accept, for I felt my inability to do justice to it. Although I have grown onions for some years I am practically a novice at the work. It appears to me that onion culture is only in its infancy. This Dominion is not producing nearly the amount that it should, or that it will raise in the near future. We have the proper climate and the soil to produce the best onions in the world. Having the proper foundations to start with, why, then should we not be at the front and produce enough for our home use and have some for export. At present there is a great number of car lots of onions brought in from the States:

To grow onions successfully it is necessary to have a good loam or sandy loam with loam predominating. It should be made as rich as we know how to make it, and to reach that end I know of nothing better than a successive application of well rotted stable manure from forty to fifty tons an acre.

In some places that is difficult to get and, therefore, each grower must do a certain amount of experimental work for himself before he can find out what will be the most economical fertilizer for him to use, because soils differ not only in chemical composition but also physically. I do not use any of the onion fertilizers, because I think that there is more cost than profit. A number in our section have tried them at different times and they have come to the same conclusion. I do not think that you can supply enough plant food from fertilizers; onions need more vegetable matter. We use a great amount of wood ashes and salt—from four to six hundred pounds to the acre. This is usually applied after plowing, and sometimes just before sowing.

Plow as early as possible in the spring. By doing so moisture is preserved. Prepare your seed-bed by rolling with a heavy roller. (That must be governed by the soil; if there is clay I would not use a roller.) Then, put on your plank or roller. I prefer a plank as it gives a nice, mellow smooth seed-bed.

Last year a few plowed early in the fall and worked the ground well, and in the spring top-dressed with manure, but, of course it was well-rotted and fine, so that it would not interfere with the cultivation. Out of four experiments three appeared to produce a better crop than by plowing in the spring. The one had the appearance of being an exceptional good crop early in the season. But, from some cause, they did not bottom up well; they were small in size, with a great amount of pricklers. The previous year this piece of ground produced the best onions in the vicinity. I am unable to account for so great a change.

The variety or kind of onion to grow has to be determined by yourself, as some markets seek one kind and some another. In our section we grow the yellow variety most; some of Southport, but the greatest amount is "Globe Danvers." There is a growing demand for Red Globes but only a few cars of them have been asked for. I have references to our market at home. I would recommend the Yellow Globe Danvers and Red Globes.

After choosing the variety comes the buying of seed. In that a person should be careful, for upon the seed depends the crop, to a great extent.

The very best seed that can be procured is the cheapest in the long run if you do have to pay a higher price. Poor seed is dear at any price. You want seed that is sure to germinate.

Do not be in too great a hurry to get the seed in the ground. Have the ground thoroughly warmed before sowing, or the weeds will get started before the onions, when the expense of keeping clean is too great.

We use the hand-drills and sow in rows from twelve to sixteen inches apart; I prefer fourteen inches as that gives sufficient space in which to work. When the onions make their appearance through the ground, start harrowing. By that means you will loosen the ground and kill weeds. The more you work the harrow the less weeding you will have to do by hand. The harrow that is used is made from light material, pine or elm strips, three quarters of an inch by two inches and three by three by four feet, with common spike nails for teeth. Then attach a strap or rope to pull it with. One man will go over a couple of acres in a half or three quarters of a day. In some cases they use a horse and have the harrow twelve to fifteen feet long and three feet wide. At first, you would think that this way would be very injurious to the crop. A few onions are destroyed by the horse, but the amount of time saved exceeds the loss by a long ways, for when the crop is ready to harvest you would not know that a horse had been on the ground.

As soon as the onions are up high enough to follow the rows, put the cultivator to work with wings on, and work as close to the row as possible, not covering the young plants with earth. We usually start hand weeding immediately after cultivating the second time, cultivating astride the row. We continue using the cultivator or digger as long as possible, for by so doing we retain moisture and keep the weeds under control. If kept perfectly clean the harvesting is much easier.

When the onions are ripe, or when the tops have fallen, the harvesting begins. We usually pull six rows and throw them into one. That gives a nice windrow to top and places the rows convenient for sacking. The sacking has to be governed by the number of men employed. We usually have five in a gang, four picking and sorting and one to hold sacks. They place them in piles, from six to ten sacks in each pile. After sacking, they are weighed up at seventy-six pounds, or eighty-one pounds a sack, but usually seventy-six pounds. Then they are ready to be loaded on cars. Very seldom, with us, are any onions housed, as the demand is so great the buyers are anxious to have them shipped as quickly as possible.

This year, owing to the shortage of cars and wet weather, a portion has been housed. The difficulty in getting cars has been a great hindrance to our section. The average crop is about 300 sacks an acre, but in some cases they will go 400. That would be about 450 to 600 bushels an acre. My talk with you is in regard to onions grown from seed. We do not grow onions from Dutch Sets or transplanted ones.

I have just given you an outline of the way we grow onions, and it would appear as if it were a very easy thing to produce a good crop, but there are many drawbacks in connection with the work. First, is the maggot, which is very small and white in color. Very often we find as many as thirty in one small onion, say the size of a pipe-stem. They follow the row and destroy from six inches to a foot in a night, for they work principally at night. They continue their work for about ten days or two weeks, and we have been unable to find anything to destroy them. We hinder their work by sowing a few turnip or radish seeds along with the onion seeds; they prefer the turnip.



The gray or corn grub does a lot of damage at times, but we overcome them by ground bran in a solution of Paris green and sow it broadcast over the ground.

Then the blight appears in spots throughout the field and is very injurious. It usually makes its appearance in dry weather and has the appearance of mildew. The onion top begins to die, leaving a small pointed stem on the onion. The neck of the onion will be spongy and full of juice, which causes the onion to soon decay. Onions hit with the blight are not fit for shipping purposes. For the maggot and blight we have no known remedy, and would like to have the Professors at the College help us out and give a remedy to get rid of them, if possible.

I have heard it stated that they have not a suitable place at Guelph to experiment on vegetable growing. I might suggest that they try an experimental station in our vicinity, for we can grow all kinds of vegetables as well as fruit. Grapes and peaches are being grown there extensively.

The CHAIRMAN: In applying the salt, have you the maggot in view?

A.—Yes, I think it clears away the maggot to some extent.

Mr. RUSH: How long after the onions are sown do you use the harrow?

A.—There is no set time; sometimes they do not come up as quickly as at other times. We use a horse on the harrow, and then we have a much larger harrow 15 feet in width. Of course, it will destroy some of the onions, but you will not notice the loss when you come to harvest the crop.

Q.—Do you ever use the Breed weeder?

A.—No.

Q.—This is done before the seed leaves the onion top?

A.—Yes, just as they are coming through.

Q.—How long do you consider it profitable to grow on the same ground?

A.—As long as you can keep it free from weeds.

The CHAIRMAN: You do not put any green manure on your onions?

A.—Sometimes we have not as much well rotted manure as we would like to have. We do not put any green manure on as a top dressing, we plow it under.

Mr. BUSHEL: Would you recommend sowing wood ashes along the top of the ground after the onions are transplanted?

A.—I would prefer sowing it before the onions are transplanted.

Q.—My idea was just to sow along where I had the line?

A.—We do not transplant any onions; ours are grown from seed.

Q.—Do you ever sow any onions in the fall of the year?

A.—No, that would be all right for transplanting.

Q.—Do you ever sow any onions without plowing the land? Take land that is loose, and just disk it up. I have heard it contended that an onion required a hard bottom?

A.—I agree with that provided it is rich. If we plow in the spring we use a heavy roller to make it solid.

Q.—How deep do you plow?

A.—We have no uniform depth; just plow it so that it covers up the manure about five or six inches.

Q.—What class of people do you get for hand weeding?

A.—Just ourselves, that is one of the great drawbacks we have up there, scarcity of help. We have been endeavoring to get some Indians off the reserve.

Mr. ROBERTSON: About the onion blight: You should get the bulletin issued by the Cornell University, Ithica, N.Y.? I am not particular

about the rotation of onions. So long as we can keep the weeds down we do not change.

Mr. ARMSTRONG: I have heard it said that you cannot grow tomatoes successfully for more than four or five years on the same ground. I have grown them on the same ground for sixteen years, and last year was the best crop I ever had.

Mr. TRICK: A man in our neighborhood has grown tomatoes on the same ground for 25 years. He uses blood and bone fertilizer, and he gets better crops all the time.

Mr. HILBORN: How do you put this bran with the Paris green on the ground?

A.—I mix a solution and dampen the bran one or two days before sowing it so that it gets thoroughly poisoned through, and I sow it broad-cast in the afternoon or towards evening, and the next morning you will find any amount of grubs on the top of the ground.

Q.—What about the birds that eat the grubs?

A.—I suppose they have their own time of it.

Q.—How thick would the application of bran be?

A.—Just the same as you sow grain broad-cast.

Mr. RUSH: Did you ever try pinching them?

A.—That is rather slow.

Q.—Do you consider that the blight and mildew are related?

A.—I think they are the same.

Prof. H. L. HUTT: They had a blight on the small onion at the Agricultural College. They were well taken care of. I asked the gardener as to how long onions had been growing on the same ground, and he said, as long as he could remember, and he had been there 20 years. The onions were so small that they would not weigh much more than an ounce. As soon as I took charge I had a rotation of crops and ever since that we have had onions of a very large size. It is a very common impression that onions may be grown year after year on the same ground continuously, but I do not think that there is any doubt that you will exhaust the ground in time of the elements upon which that crop feeds. If you adopt that plan of continuous cropping you must certainly get the ground more infested with the onion maggot, and I think that the matter of the rotation of cropping should be looked into very carefully.

Mr. ARMSTRONG: Where a man is an expert and able to supply what is extracted from the land he can use the same ground. We use it simply because it is the very best for the purpose.

Mr. McMEANS: Do you do any work towards cleaning your ground after the crop is harvested?

A.—Yes, owing to the scarcity of help we summer fallow part of the land and we plow under the onion tops.

Mr. McMEANS: One of the boys from our locality went to Kalamazoo, and when he came back he said that he had seen the biggest crop of onions he had ever beheld, and the men who grow these onions clean up every bit of their land in the fall. He asked them why they did that and they said that they wanted to grow onions on that land next year, and wished to have it thoroughly cleaned.

Mr. GAMEY: I have a strip this year that has got the black mildew just like the smut on grain.

Prof. HUTT: I think that it is a different stage of the same disease. What do you attribute the scallion onions to?



A MEMBER: I think that it is the seed. I had two patches of onions on the same ground and one had scallion and the other did not. I think it was due to the seed, because I had two different kinds of seed sown on that ground.

The CHAIRMAN: I think that you will get thick necks as long as you sow onions on black muck. We sow about two and one-half pounds to the acre and we do not have to thin out very much.

Prof. HUTT: I think that if the seed is grown from immature bulbs you are likely to get a large amount of thick necks. The onion is grown on black muck around Kalamazoo, and they grow beautiful white onions right between the celery, and they are very careful to cover all refuse, so as not to allow the fungus or insect pests to infest the soil.

Mr. COLLINS: I grow my onions on black muck, and I very seldom get any scallions, unless it is caused by the seed. The land may have something to do with it, but I do not think that it is the black muck land.

Mr. McMEANS: Five miles from our place they have black muck land, but it is very different from the black muck we have. Their muck only seems to be down three or four inches, and there is light sand underneath it and quicksand underneath that. They produce good onions on that muck. The muck I had reference to would run from six inches to four inches deep, and it is a clay and lime sub-soil.

Q.—How much wood ashes an acre do you usually apply?

A.—That I really cannot say, because we never weigh them. We get all the ashes we can, and mix them with salt, and sow them perhaps a week after they are mixed and sow them broadcast the same as grain. Take a medium hand full and give it a cast at a step.

Q.—About what proportion of salt?

A.—About one-third, sometimes a little better.

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## CELERY GROWING.

BY T. BENSTEAD, STRATHROY.

You can grow celery on almost any soil, but to make money out of it, you must have black muck. I manure my ground during the winter when the ground is frozen. I put on about fifteen loads of manure to the acre. As soon as spring opens up, and the ground is fit to plow, I plow it about five inches deep. After that I work the ground thoroughly. The next thing I do is to put about sixty bushels of wood ashes to the acre. I then work the ground again, first with the disk and then with a harrow, and again I put on ten hundred pounds of bone meal; then another stroke with a disk and smoothing harrow. Next half a ton of salt. (The reason I put them on separately is I can better see what I am doing.) I then have got the ground pretty well manured to start with. I sometimes use a little fertilizer between the rows, when the crop is growing as I believe that that is a better plan of fighting blight than spraying. I find that if the plant is well fed the blight does not bother it much. I then keep the ground thoroughly cultivated until we are ready to put the plants out growing.

The plants for early planting we start in a hot bed about the fifteen or twentieth of March. If we start much sooner we find that we have quite a lot of bolters or seeders. We sow in rows about four inches apart in the hot-bed and about as thin as we know how. As soon as these plants are two

inches high we transplant them about two inches apart each way in a nice sheltered bed of well enriched soil. For the main crop we sow the seed about the middle of April in the open in beds about five feet wide with about an eighteen inch walk between the beds. I like to shear the tops of these plants about this time, and I like them to stand not too thick and close together. I find that these plants—by so grading as not to mix big and small plants together,—do not sucker nearly as much as transplanted ones. They can be planted much faster, and you can grow just as good a crop.

In planting I pull most of the plants myself, and put them in boxes about four inches deep with wet soil or moss in the bottom, the plants standing upright. These boxes are small and handy for the boy to carry, and drop them out at each space. They then do not get wilted before they are in the soil, and a man will plant far faster when the plants are kept nice and fresh. A good planter will plant from eight to ten thousand a day.

I run rows north and south as the sun shines on both sides of them, and I know I get a better crop than where the rows run east and west, with the sun shining most of the time on the south side of the row. To mark or space the rows I use a wheel with cleats nailed on for single rows, six inches from plant to plant; for double rows, seven inches. I do not know that this is altogether a necessity, yet I know that it pays, as a man will plant faster and your plants are a uniform distance apart, and again in double rows, the plants being exactly opposite each other. You can hoe them just about as handily and as fast as a single row. In laying the ground out, on the space between rows, we always have used a line, and for celery that I intend to bleach with lumber, we put our rows three and a half feet apart; for what we intend to bank, four feet, in planting. Our land is nearly always damp enough so that we can plant all day. About a week after the plants are out we start cultivating, going as close to the plant as we can without smothering them. I start a six to eight tooth cultivator and let it run deep for two or three times, and then ease up a little, but I do not stop cultivating. If the weather is wet it warms and sweetens the soil. If the weather is on the dry side, shallow working of the soil, I find, keeps it moist. In a real dry time we rub the soil, and a very good thing for that purpose is an old harrow with the teeth removed and two pieces of scantling wired to the frame so that they work the soil from the plant instead of throwing it to. A hot soil coming in contact with the plants does not do them any good. Rub the soil every day if possible, in a very dry time, as the crop is evaporating much, and our only hope is to head off capillary robbing. I have a boy sixteen years old who can plant 1,000 plants an hour from morning until night.

Q.—Do you notice any wilt after they are planted?

A.—No, our land is always moist. Our planting generally runs over 20 or 25 days. After the plants are in I start to cultivate with a fine tooth cultivator, and work pretty close to the rows. After they have made some growth I put on a big tooth cultivator. We have to use bog shoes. The horses cannot walk on it without an eight inch bog shoe on. I like to cultivate once or twice every week. I always plant double rows, and have the plants exactly opposite one another. I can hoe a double row, just as fast as you can hoe a single one. I plant them seven inches apart each way. My rows are three feet nine inches apart where I bleach with boards; and where I bleach with muck it is four feet apart. I have never been bothered with blight. I grow the White Plume, The Golden Yellow, and The Golden Heart. I believe that the blight is caused quite a bit by the manure used. I believe you could feed past the blight. A gentleman half



a mile from me has the same kind of soil, and this year his crop was completely killed by blight. I raised the same celery, but he uses nothing but barnyard manure.

Q.—Was your land a cedar swamp?

A.—Tamarack swamp. It is full of decomposed wood.

Q.—Will your land dry out?

A.—No, I have a tile drain every four rods, and my tile are down about 20 inches. When I put the tile in I put a good coat of straw on them.

The CHAIRMAN: I scuffle just as little as possible after the celery gets six inches high.

Mr. BENSTEAD: I scuffle as much as possible; if you scuffle deep on the start your roots will grow deep.

Mr. RUSH: Did that neighbor of yours, whose celery was eaten up by blight, plant salt and wood ashes?

A.—Nothing but barnyard manure.

Q.—Do you think that the ashes and salt is a preventive?

A.—That is what I said. Salt is a preventive of slugs. For bleaching early stuff I use foot lumber 16 feet long. I wire through from one side to the other. If you put it up straight it will never warp. I generally calculate about four dozen and a half celery to each sixteen feet, and I, therefore, know just how many boards to take up when I want to ship. For bleaching with muck I start in about the 20th of September. I go through with the Planet Junior and throw up some muck, and we use a bush scraper with a man on each side of the row for the last operation. This year we had a snow storm of fourteen inches on the 10th of October, and it covered my crop of celery completely, and my White Plume was badly broken down.

Q.—Do you grow single or double rows when you bleach with earth?

A.—Double rows. The only celery I grow in single rows are the Golden Heart winter celery. It takes three weeks to bleach with muck. Our muck washes off pretty easily if you do not let it dry on. You must take it to the wash room directly after you take it up. I do not use a brush; never use anything for washing. I use a force pump. I am putting in water from the waterworks, and then I will get all the pressure I want.

Mr. RUSH: Where do you find your principal market for White Plume?

A.—St. Thomas and Brantford. I have no home market. I do not care if I ever sell a head there.

Q.—Do you store any?

A.—Yes, we have 50,000 on hand now.

Q.—Explain how you store it?

A.—I would like to get rid of most of it before Christmas; and I store it right in the muck. I run out a trench with the plow, and I put the celery in three heads wide until I get six rows with three heads in a row. I leave it like that with the tops exposed until it comes good hard freezing weather, and then I throw on four inches of muck, and leave that till it will bear me to walk over it, and then I use a little stable litter after that. I think that there is more celery spoiled in trying to keep it too warm than in leaving it a little too cold. My celery has as nice foliage when it comes out as when it goes in.

Q.—Have you ever tried celery houses?

A.—No, I never have. I was down at Thedford this summer, and there are two men there growing 30 acres, and they have a storage house that cost about \$1,000. It has cement foundation and is 100 feet long. It

has a shingled roof with tar paper under the shingles. He has it high enough so that he can put overlays on the plates, and he fills the top of the roof with marsh hay, and he says he never has any frost in that house and keeps the celery in good condition.

Q.—Any ventilators in the house?

A.—Yes, big ventilators every ten feet. He has big sacks of sawdust on a pulley and he lets that hang down, and when it gets cold he just pulls that sack of sawdust into the chimney. He sets them right on the soil in that storage room. He trims the tops in the row before they are lifted, the same as I do.

Q.—Do you ever trim the tops while they are growin'?

A.—I never did. I know a person that does and he says he gets a bigger head of celery.

Q.—Is it considered as good quality if grown in black muck as on high land?

A.—Some consider it is sweeter celery on the high ground. I remember I was in Toronto ten years ago, and at that time I bleached my celery with muck, and one salesman said, "Do you think that this celery is as good flavor when bleached with boards as the muck bleached celery?" Another salesman said, "We do not care about the flavor as long as it looks all right."

Mr. RUSH: I think that the White Plume has better flavor when grown in muck than if grown on heavier soil.

The CHAIRMAN: What strain of White Plume do you grow?

A.—I get it from Vaughan, in Chicago. My Golden Heart I get from Angus McInnis, London. I like to buy two pounds at a time. Celery seed will germinate when eight or ten years old, and when I try it I know I am all right for seed as long as that seed hangs out. McInnis's White Plume is very good.

Mr. RUSH: I think that if we can get good seed in Canada we should purchase it.

Mr. BENSTEAD: I do, too.

Q.—Do you water the celery that you have stored?

A.—I never do.

The CHAIRMAN: Mr. McInnis, of London, is here, and he is one of the best celery growers in the province, I would like to have him address us for a few minutes.

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## CELERY HINTS.

BY ANGUS MCINNIS, LONDON, ONT.

I am sure it is a pleasure to be called on to address this meeting, and I will tell you as briefly as I can the way I store my celery. I simply take it up in the field where I grow it. It is grown four and a half inches apart with eight inches between the plants single row, and when I am digging I lay down sixteen feet boards, one foot wide. I stand them on top of the trench and clean out between them and bank them up, and I stack the boards along, three stacks to each board, one at each end and one in the middle; I stand the celery in the trench and I have a roof made out of three feet boards one foot wide and three feet long. I nail an inch cleat on the bottom end of this board one and a quarter inches from the bottom. I



have a cleat at the top as well as at the bottom, and when I am putting up my roof I lean them against one another, and you can lift these boards off any place you want to, to get out the celery. I make the beds from forty to one hundred feet long. We throw a little dirt on the top of these boards at the bottom. If you throw too much on you are apt to spread your bed. When the weather gets cold we put more earth on and then some litter. I grow from 50,000 to 70,000 celery every season. I grow Golden Heart for my seed. I grow my own seed, and I select it every year from the very best plants. The biggest difficulty I find is in saving the plant over to grow the seed from. Sometimes I have a failure, and do not grow any seed for several years. I only grow Golden Heart seed. The Paris Golden Yellow I buy in Paris, France.

I do not grow early celery. In starting seed, I prepare my bed in the fall and sow the seed about one foot apart in the rows. I sow a lot of seed so that I will have lots of plants. I trim them and cover it with glass, and then take off the glass and plant it out into the field. We do not transplant it or cut off the tops.

Mr. McMEANS: Do you trim your celery before storing?

A.—No; I just take off the bad leaves.

Q.—Have you a good local market?

A.—Yes, I can always sell celery; more than I can grow. We have black muck soil, not very deep.

J.—Are you bothered with blight?

A.—Yes, some; on account of it being too wet I was bothered a little this year. I think salt and ashes are very good to prevent blight. I have found that the blight has been caused by fresh manure being plowed in.

Mr. RUSH: Two years ago Mr. McInnis sent me a couple of barrels of celery by express; it was in big sugar barrels, and I thought there were two layers. It was away up above the barrel. It was put in my stall in the market, and the address from London was on the barrel. My son happened to be in London, England, at the time and some of the customers thought he had sent these out from England. The celery was about three feet long and bleached to the top. My customers went home, and I had telephone messages from all parts of the city to save them some of this London celery. I sent a message to Mr. McInnis to send me all the celery he had, but he was mean enough not to send me a barrel.

Mr. McINNIS: Just at that time we have a great demand in London, Ontario, and I could sell 400 or 500 dozen a week. I always bank the Golden Heart for the winter. I cultivate it in the middle of September, and then take the mould boards, and I have a scraper and I pull the dirt up to the plant, and in a couple of weeks' time I go through the same operation again, and shovel it up with a shovel and bank it up good and tight. If the weather is warm and it grows, I have a scraper, and I go along and press the earth in against the celery to keep it from freezing.

Q.—Do you find cultivating the celery before the dew is off has a tendency to increase the blight?

A.—No, I do not think dry earth should be put up against the celery. If the dirt is too wet or too dry it will cause blight and the rust.

## MELONS AND MELON GROWING.

BY W. G. HORNE, CLARKSON.

Perhaps if we were told that we were to be deprived of one of the fruits we grow in Canada, and had the privilege of saying which one we could dispense with most easily, it might be the melon, although there are a great many people very fond of both kinds of melons.

We grow both the watermelon and the cantaloupes, or what are more commonly known as muskmelons. It is amusing to note the many different palates we have to cater to to satisfy the appetite for the muskmelon. Some people prefer eating them with sugar, others with salt, and some are fond of them after they have turned yellow, thinking that they are not ripe until in that condition. In this they are greatly mistaken. I think, however, that the majority prefer the melon in the natural way—ripened on good, healthy vines. I do not think that a melon ripened in any other way can be either wholesome or healthful; but there are, I presume, a great many eaten that have not been ripened in this way. What do we see shipped into Canada in the early part of the summer every year from our friends to the south of us? Cases of muskmelons by the hundreds, obviously plucked green, with stems hanging on them as long as pigtails. A muskmelon plucked with its stem attached has not ripened properly, and never will. A genuine, ripe muskmelon is one that has left the vine perfectly free from the stem, and it should leave it at the least touch or pull. A muskmelon plucked in any other way is not ripe. Yet, I presume, these melons that are shipped in this premature state are eaten, and they realize good prices. It seems to me that if our own growers sent a few contingents of that class of fruit, we would soon have our papers crying out that our melons were tasteless, and perhaps we would have the inspectors after us.

We do not know a ripe watermelon until it is cut open. It is simply a matter of judging. Some of the most experienced growers are deceived sometimes, more especially when they begin to ripen, or are in the first picking. There are two or three signs of knowing or judging when we expect them to be ripe. Some think that when the first curl or tendril next the melon is dead is a good sign, and some contend that when they crack with little pressure they are ripe. The best sign is by the sound. If your melon when tapped with the thumb or hand gives a dull, thud-like sound, it is ripe. It is likely that the other signs will be in evidence, too. The stem of the watermelon retains its hold as firmly when ripe as at any other time in its growth.

A muskmelon plucked green will, in time, turn yellow. Some varieties do so more than others, and appear to ripen more quickly, but such is not the case. They are deceiving you; it is practically the first stage of decomposition. It is the yellow ones that need the sugar and salt. If you want a good melon do not take the yellow ones. The watermelon plucked green will not deceive you from the outside by turning yellow; it simply will not ripen in any form whatever. It will gradually decay, although as green as when picked. A muskmelon is at its best for eating in the early morning, when it is nice and cool. A person who likes the musky aroma and flavor will both taste and smell it at that time, in its fullest strength.

Watermelons are eaten much the same way by all who are fond of them. They are not grown so extensively as the muskmelon. Our friends on the other side have had the inside track of our watermelon market for



years, and I presume they will hold it. It is simply impossible for us to compete with them in the growing of watermelons, as they have the advantage in climate; but I think we can grow watermelons with as good a flavor, and just as large, if we plant the right variety.

Our greatest drawback is in not being able to get them on the market earlier in the season. By starting them in hotbeds we can gain two weeks over them planted from seed in the open. The only profitable way for us to grow watermelons is for our own local markets, where we can do our own hauling of them; we find that they are too heavy and bulky to ship by express with other fruit. When a good crop is in evidence we also find the muskmelon a little too bulky to ship with the other fruit. Muskmelons are grown more extensively than the watermelon. We need not fear competition from our Southern friends in the growing of them, as they have to pluck theirs green to stand the long distance shipping, and a limited amount of that class of melon is all our market will stand. As soon as our melons appear, which have properly ripened, the American product disappears until the next season. The muskmelon needs to be eaten within three days after ripening; after that time it becomes tasteless. The watermelon will stay sweet and good for eating much longer, perhaps two to three weeks.

For growing both kinds of melons we require warm, sandy land. Melons will stand a lot of manuring. We sometimes read accounts advising manuring the hills. I prefer putting it on broadcast. It is too concentrated in the hills, and has a tendency to dry them out. All the root that need feeding are not in the hills alone. I believe that the roots extend as far under the ground as the vine reaches above the ground. I have turned them up with the cultivator much farther than I expected they would reach. That strengthened my opinion that manuring broadcast was the best way.

They also need good cultivation. You cannot very well work the land too much. While the vines are small, it is well to have your land as free from weeds as possible, as you only have a limited amount of time to keep them down before the vines begin to run. The hot seasons suit them best. They are always of a better flavor when the season is warm. They can stand dry weather for a long time if we have heavy dews at night. They do not require much rain. Too much wet weather causes the muskmelons to crack open, which renders them unfit for the market, and not much good for eating. Where the land is in good condition the watermelon should be planted at least seven feet apart each way to grow good melons. It grows a long, slender vine, with small foliage for so large a fruit. Muskmelons can be planted much closer; five feet each way is the usual distance. Three plants left in a hill is plenty. Both kinds are prolific. An acre of muskmelons is capable of producing 800 dozen; watermelons, from 400 to 500 dozen, weighing possibly some fifty tons. These estimates would be an excellent crop, but a possible one.

We have much to contend with in growing melons for the early market. It is necessary to start them in hotbeds, which means a great deal of extra work, and work that needs our closest attention, because if neglected at certain critical times you have a lot of your plants lost and your labor as well. Perhaps the most critical time in raising melon plants in a hotbed is at the time of germination, and just after they have made their appearance. The best temperature for growing melons at this particular time is from 75 to 80 degrees. In fact, this temperature is the best for them at any time; but after being planted in the open they have to stand sometimes a temperature not very far above freezing point, so that it is as well to get them used to as low a temperature as possible for a week or so before moving them out into the open field, so as to have hardy and strong.

In starting the melon in the hotbed it has to be planted so that when it is moved into the open the roots are not disturbed. Melon plants will not transplant in the true sense of the word. We have to plant either in pieces of sod or in pots, so that when moved out to the field they can be planted without interfering with the roots. Some people prefer the pots to the sod, claiming that the plant takes root quicker than those planted in the sod, on account of the sod being full of grass fibres. I have tried both, and have not noticed any difference.

There is a distinct advantage in using the sod to using the pots. The pots, for instance, have to be filled with the choicest of soil, which has to be found every time you plant, and they cannot be handled so easily as the sod when drawing out to the field. Then, again, the pots have to be cared for from one year to the other.

With the sod you simply have to cut, place closely in the frame, and plant. When drawing them out to the field, have them well soaked with water. Make your hole deep enough so that your sod will be two inches below the level. Plant it as you would plant anything else, and that is the end of the hotbed work as far as the sod is concerned. The fact of the sod containing fibres of grass holds it together and makes it easy to handle.

#### INSECTS THAT ATTACK MELONS.

Insects are very troublesome and annoying at times. A man needs to be a Christian, in the truest sense of the word, to combat with them without complaining, and wondering what good they are and why they were sent to torment us. I am afraid I cannot give you their correct and proper names, as the nomenclature of the entomologist is a puzzle to me. If I did know their proper names, I would not dare to attempt to pronounce them.

There are three that generally make their appearance, more or less every year. Each one has his own peculiar way of doing his work. I cannot say which is the most detestable. They are all bad enough. The first one to attack the plants is the cutworm. Nearly every person who has had anything to do in the raising of plants is acquainted with its method of attack. It has a clean, decided way, and there is no doubting the results.

The next to make its appearance is the yellow striped beetle. Their mode of attack is different. They are lively little suckers. (Laughter.) They sometimes come in very large numbers, and if left for two or three days soon destroy a melon patch. They suck the sap from the leaves, leaving the plant a mere skeleton. We do not know of any remedy that will destroy them. We check them by dusting the plants with land plaster, putting it on in the morning when the dew is on the vines. The plaster adheres better at that time. They do not seem able to work so well when the plaster is on the leaves. If the leaves are dusted for a few times, most of them leave. There are some that stay till the blossoming is over. They are very fond of the blossom, and work in them very much, and I think that they cause the greater part of the deformed melons.

The third insect to annoy us is, perhaps the most tantalizing of the three, as well as the most repulsive. We call him the pumpkin or stink-bug. The last is the most applicable, because, when killed, the scent which permeates the air puts one in mind of that odorous animal that likes chickens. The pumpkin bug is another sucker. A plant attacked by him commences to wither and gradually dies. Its work takes place generally when you have every prospect of getting from four to six nice melons from your melon hill. Suddenly you notice your vines begin to wilt, and growers of melons know what that indicates.



We find that to realize good money for melons it does not depend altogether on their quality. Often the inferior classes of melons bring the fancy prices. Take, for instance, those shipped us from the other side. I also saw some of our own growing shipped as recently as this fall by a neighbor of mine, that were simply rubbish alongside of good melons. The grower owned to me that they were no good, but as long as he could get fancy prices for them, which he was getting, he intended to ship them. Good prices are paid for such samples simply because there is a demand for melons and few are to be had. No one who sells such melons can have any pride in shipping such rubbish. A man who has a good article to sell is proud of it. He is not afraid to meet the person he sold it to. It gives satisfaction in every way.

To grow good fruit is pleasure.

To sell good fruit is pleasure.

To eat good fruit is pleasure.

Adding the three together makes a threefold pleasure that is well worth our while trying to cultivate and bring into effect. It is simply nothing more nor less than our duty to do so.

MR. W. T. MACOUN: You say that you do not approve of transplanting in the same way as you would a cabbage plant; you do not believe that it is possible?

Q.—I never found it possible.

MR. ADAMS: Last year I had some melons that failed to come, and we had plants in a pot, and we took them out and planted them in the field, the same as we would cabbage plants.

A MEMBER: I have had them in boxes, and have planted them out without being careful about the earth.

MR. HORNE: You might do that once or twice, but to plant them extensively on a large scale you would find it would not be successful.

MR. ADAMS: We planted 1,000 in that way last year. We like to put two plants in a hill. Do I understand you plant these hills by hand?

MR. HORNE: Yes.

MR. ADAMS: We put them in with a cultivator, two feet apart in the row, and the rows five feet apart.

MR. HORNE: You would not cultivate them both ways.

Q.—Where does that pumpkin sucker attack it?

A.—In the stem below the ground.

Q.—What do you do to prevent it?

A.—All we can do is to catch them and kill them.

Q.—You say that the cucumber beetle is a sucker?

A.—Yes, I think it so because they leave the leaf like a skeleton.

A MEMBER: They stick to the end part of the leaf, and I think that they eat just the same as a potato bug.

MR. ROBERTSON: It is the cucumber beetle, and a beetle has jaws to bite.

A MEMBER: It bites the leaf all right.

MR. HORNE: The rose bug is said to be one that sucks, and it works on the grape vine in the same way.

MR. ADAMS: We find that the rose bug in Essex will bore a hole in the peaches and get right in there.

MR. HORNE: I think that they are sucking insects.

MR. ADAMS: We find that the Bordeaux mixture applied to melons will drive them out.

Mr. MACOUN: We find that the Bordeaux mixture on melons is the best for all these insects; and it is the same with the flea beetle that attacks the potato vine. You will find that a great many diseases will start in these holes that the bugs make, and we find that there is nothing like a good coat of Bordeaux mixture to get rid of them.

Mr. HORNE: I think that it is proper to keep the foliage perfect in growing anything.

Mr. McMEANS: The end part of the leaf is where the flesh is and it is skin on the top, and that makes it appear as if the leaf had not been open. If you will use Paris green it will drive them away very quickly. We have not had any melon bugs for two years. I think that the cold summer of two or three years ago did away with them. You will have more of them where you grow a great many melons. There is another sign to know when a watermelon is ripe. There is a rash that comes on the melon, and it is very fine, but the more rash you find the riper the melon. The best way to do away with the cut-worm is to take shorts and Paris green and molasses and mix it so that it will be moist enough to stick together in little lumps. Sow that broadcast on your land. A pail full will do half an acre. They eat it in preference to anything else. The smell of the molasses draws their attention, and they like shorts better than bran. There is no trouble in doing away with cut-worms if you do that.

Mr. MACOUN: That is our plan for doing away with them. I have counted seventeen dead cut-worms around one tobacco plant.

Mr. HORNE: You need to have something tempting to take them away from the tender plant just from the hotbed.

Mr. MACOUN: It is as easy to transplant melons as it is cabbages or anything else. I have grown cucumbers and transplanted them just the same as cabbage.

Mr. DELWORTH: In Montreal they sow the seed in strawberry boxes and set them out. Mr. Williams, of Ottawa, sets them out on his benches in the greenhouse. He sows four or five in a box and thins them down to two. Mr. LeGarry, of Montreal, raises them in hotbeds. Mr. LeGarry's father has little boxes made without bottoms, about six inches square, and these boxes are set on the soil and the seed is planted in them. Mr. Williams said that at one time he thought it was good practice to break off the corners of the box to allow the roots to run. He thinks that it is better to disturb them as little as possible, and he plants the boxes in the hole and lets the plant find its own way out into the soil.

Mr. McMEANS: Do you prune your melons any?

Mr. HORNE: No, I believe in doing it, but we do not get any time. It is my plan to nip the ends off to allow the laterals to come on.

Mr. McMEANS: It is the second lateral that brings the melon.

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## A FEW WORDS ABOUT OTHER VEGETABLES.

By A. McMEANS, O.A.C., GUELPH.

BEANS. I would recommend for early, Keeney's Rustless or Wardwell's Kidney Wax. For medium, I know of nothing better than the Davis Wax, a wax bean with a white pod. Should beans be a drug on the market, and you too busy at something else, you can let it go, and get a dry, white beat for winter sale. For green, Valentine and Stringless Green Pod are both



good, and will bear pushing with your customers. The green beans are not appreciated as they should be by the people of Ontario.

**BEETS.** I used to grow Egyptian for transplanting and Eclipse for early, but, having a variety test of fifty-five varieties at the College this season, I would add Model to the above. It is deep, globular in shape, size and season medium, color and quality good. Black Red Ball, shape nearly round, becoming angular with age, top medium in size, upright and dark in color, flesh color dark red zoned with crimson, quality good, season medium.

**CABBAGE.** Early Jersey Wakefield for early, to be followed by Early Summer or All Head for winter. Danish Round Head (which is an improvement on Half Head), Hollander, and Diamond Winter are all good. For an extremely late, the Houser is good, but inclined to be a little coarse. (Black Rot.)

**BRUSSELS SPROUTS.** Improved Dwarf is good. I was much pleased to see the display of this vegetable that was made in the Exhibition Hall. This is a vegetable that will bear cultivation—that is, cultivate your market for it. Boom it. Get people to try it, till it is appreciated as it should be. I may say that on the other side of the line they are operating it. The wholesale price in New York City is from six to ten cents a quart.

**CARROTS.** It is hard to beat the Chantenay. But in our variety test the Rubicon outyielded it. It seems to be an improved Chantenay in size. As yet I have not had the pleasure of testing it for flavor.

**CORN.** Early Corey, Crosbys, Kendall's Early Giant, Early Evergreen, Stowell's Evergreen, and Country Gentleman will give you a succession. For the private or amateur grower, I would say grow Golden Bartam and Black Mexican. They are both good flavor, but on account of color they will not take on the market, and yet I would advise everybody to try some of both of these varieties. A little word of caution may be given here: Be careful not to plant them near your other sweet corn, or they may pollenize some of it, causing some grains to be yellow and black in color.

**CUCUMBERS.** Corey's Early Cyclone; for early, White Spine, and for pickling, Westerfield's Chicago Pickling.

**LETTUCE.** For under glass, Grand Rapids and Hothouse. Outdoors, Hauson. This variety is sold also under the following names: Gardener's Favorite, Nonpareil, Hamilton Market, Toronto Gem, and Excelsior. It is too well known to need description. Unrivalled is about the same as Big Boston, slightly lighter green, and without that brownish tinge on the borders. For quality, Deacon is good. It is sold under the name of Big Head, Golden Heart, Summer Gem, St. Louis Butter, Triumph, and White Russian. It is a buttery cabbage, midseason, slow to shoot to seed, head globular or slightly flattened, color light grayish green, and quality excellent. Black Seeded Simpson should not be forgotten if you prefer the loose leaf or cutting lettuce.

**PARSNIP.** Hollow Crown is preferred by most people. I prefer the Guernsey. It is about the same in circumference as Hollow Head, but shorter, holds its size, and does not taper off as much as the Hollow Crown. It will crop out equally as well, and when you take into consideration how much easier they are to harvest it makes an extra inducement to grow the shorter variety.

**PEAS.** Surprise, Nott's Excelsior, Gradus, and Stratagem will give a nice succession.

**RADISH.** For forcing, Rosy Gem, Ruby Pearl, Scarlet Turnip in the turnip shape, and in olive shape I have found none better than Scarlet Coni-

cal. Outdoors, Scarlet Turnip, White Tip, French Breakfast, Chartier's Long Scarlet, Short Tip, in the reds; White Box, Long White, Vecima Icicle in the white; and Delicious in golden. All are too well known to need description. China Rose and Black Spanish for winter.

SALSIFY. Sandwich Island.

SQUASH. Summer Crookneck, Delicious, Marblehead, and Hubbard. The majority of growers make the mistake of leaving the Crookneck until the shell gets hard, whereas if they cut them when the shell was just beginning to get hard, when you can indent them by pressing on them with your thumb, you will find them far nicer. Just take them and wash them and cut up and cook. Try them this way once and be convinced. The Marblehead are not grown enough. It is a sort having a grayish white skin, with a nearly smooth surface, and is somewhat smaller in size than the Hubbard, but has less waste in preparing for the table. It is as productive and the flesh is as dry, as thick, and as good as the Hubbard, and it ripens about the same season. Delicious is a fall and winter variety, size small to medium, flesh thick dry, and of very best quality. Grow this variety when you want quality rather than yield. If the amateur wants one squash to cover as much of the season as possible let him try Delicata or Perfect Gem. Fordhook will give him one of the best flavored squashes, but it is too small to grow for the market.

I think that we should get our customers and dealers to push Brussels Sprouts. They get ten cents a quart for them in New York, and we can get that price if we educate the people up to eat them.

Mr. DELWORTH: Which Corey do you use?

A.—The white one.

A MEMBER: I want someone to give me information on the black rot in cabbage.

Mr. MACOUN: That is one of the most difficult diseases to control. A special investigation was made as to that disease at Ithaca, N.Y., and they published a bulletin on the subject about a year ago. They did not discover anything that was of much value in preventing it. They recommended that all the leaves that were left over in the field should be destroyed, and also every part of the cabbage that was wasted, and, if possible, to change the ground. The Howser cabbage is much freer from it than others.

Mr. McMEANS: You must plant the Howser earlier than the other cabbage. I was around Nova Scotia, and the growers there thought that they could have their loaf and eat it. They were selling their cabbage and planting the stalk to grow their seed from, and the result is that they have very poor cabbage.

Mr. MACOUN: I do not think that it would be a good policy to cut the head off and then get your seed from the side leaves.

Mr. ROBERTSON: Is the original head of the cabbage used to develop the seed stalk when it is developing the seed?

Mr. MACOUN: Yes.

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## THE WORK OF THE BRANCH ASSOCIATIONS.

Much valuable work was accomplished during 1906 for the benefit of their members by the branch associations of the Ontario Vegetable Growers' Association. The Ontario Association has been organized so recently that as yet some of the branch associations have not got in complete working order. What promise to become two of the strongest branches—those at Ottawa and Kingston—were not organized until April, 1906.



Most of the branches hold regular meetings for the discussion of matters relating to vegetable growing, several purchase baskets, boxes, and other supplies in large quantities, and at cheap rates, for the benefit of their members, one or two hold an annual excursion and picnic in the summer and an annual banquet in the winter, which so far invariably have proved very enjoyable and successful, and a splendid means of securing new members. Through the branch associations the vegetable growers in each section are brought into close touch with one another. The Ontario Association, in turn, serves to bring the members of each branch association into touch with the members of each of the other branches throughout the Province. The Ontario Association is planning to furnish competent speakers for the meetings of the branch associations.

The following are reports of the work done during 1906 by several of the branches:

#### THE TORONTO BRANCH.

*F. F. Reeves, Humber Bay, Secretary-Treasurer.*

The Toronto branch of the Ontario Vegetable Growers' Association during the past year has been successful beyond the most sanguine anticipations of its members. We close the year with a membership exceeding 200 of the most successful and progressive vegetable growers in the vicinity of Toronto. We have had nine meetings during the year, all of which were well attended. In starting, the members decided on the first Saturday afternoon of each month for regular meetings, and instructed the executive committee to procure the best men available as speakers on subjects of interest to vegetable growers at the different meetings.

At the January meeting, 1906, interesting papers were read by Messrs. R. Lankin on "The Best and Most Profitable Way of Bunching"; G. Syme, Jr., on "The Best Way to Market Our Produce," and by J. McKay, on "Cauliflower Growing." At this meeting the executive committee were instructed to interview manufacturers and seedsmen and obtain prices on boxes, Paris green, and bunching twine, and report at the next meeting. The committee was given power to make all arrangements for the annual banquet. The banquet was held at Webb's on January 24th. Upwards of 150 were present, including Hon. Nelson Monteith, M.P.P., Minister of Agriculture; A. Campbell, M.P., Speaker J. W. St. John, M.P.P., W. F. Maclean, M.P., W. A. Emory, George Syme, Sr., and H. B. Cowan.

At the February meeting very fine papers were read by Mr. T. Delworth on "Rhubarb Forcing," and by George Syme, Jr. on "Celery Growing." A motion was passed asking the members to report to the executive committee any failure of seeds to come up to what they had been represented by seedsmen. The committee to take any action on such reports they might deem necessary.

Prof. Harcourt, of the Ontario Agricultural College, Guelph, gave a very interesting address at the March meeting on "Commercial Fertilizers," and offered to furnish fertilizers, and instructions how to use them, to gardeners selected by the branch to conduct fertilizer tests on different vegetables. The proposition was accepted, and growers were named to experiment on onions, tomatoes, celery, potatoes, and cauliflower—four on each. The branch forwarded a request to the Ontario Agricultural College to conduct experiments to ascertain the cause of spot on beans, tomato, onion, and celery blight, smut on corn, and cabbage root maggot, and to find the best and most practicable method of combatting these diseases. The executive committee presented its report regarding the purchase of boxes, Paris green, and

twine. It reported that boxes could be procured from a certain firm at 12c. a box, to include printing, a decidedly lower price than the members had been paying; that Paris green could be secured for 18½c. a pound for Canadian, and 19c. a pound for Berger's English. Twine, three ply, they reported could be bought for 20c. a pound. and four ply for 23c. a pound. We consider this a practical example of what co-operation can do, the saving on boxes alone having been from three to four cents each.

At the meeting held March 17th two additional directors were elected on the Provincial Board. The following subjects were then taken up: "Celery Growing," by Messrs. W. Harris and S. B. Courtis; "Growing Early Beets," by A. Shuter, and "Growing Early Cabbage," by James Stevens. Messrs. J. W. Rush, A. Shuter, and C. Gibbard were appointed crop correspondents for the Toronto District.

The subjects for the April meeting were: "Growing Early Potatoes," by James Dandridge; "Growing Early Tomatoes," by James Gibbard, Sr.; "Glass in Relation to Outdoor Work," by H. E. Reed. A motion was passed suspending meetings till July.

Business in July was solely in connection with our annual excursion, which was held to St. Catharines on Wednesday, August 1st, and was one of the most successful we have ever held. Owing to the pressure of work, the August and October meetings were merely routine. Plans were made for the ensuing winter meetings. At the November meeting the members were well pleased with a paper on "Growing Early Vegetables," by James Stevens.

In closing this report, I think great credit for the successful year should be given the President, George Syme, Jr.; R. Lankin, Vice-President, and Messrs. T. Delworth, J. W. Rush, J. McKay, and W. G. Carter who, with the Secretary-Treasurer, formed the executive committee.

#### THE HAMILTON BRANCH.

*James A. Stevens, Hamilton, Secretary.*

During 1906 eleven meetings were held by the members of the Hamilton branch of the Ontario Vegetable Growers' Association, with an average attendance of about forty-five. Our total membership was eighty-one. While regular subjects relating to vegetable and fruit growing have not been discussed at our meetings in the past, it was decided unanimously at our last meeting that such subjects will be taken up and discussed by practical men at each meeting hereafter.

Prof. Sherman, late of the Guelph Agricultural College, attended our last meetings and gave valuable information regarding the best methods used for the eradication of certain insect pests. After this meeting it was decided that talks by such experienced men would prove of great interest and value to all our members.

The basket question has been of great interest, owing to the factories having combined to increase prices. Our association was not willing to abide by the advanced prices, and arrangements were made by the President, E. J. Mahony, and myself, by which the members of our association were able to save nine per cent. These arrangements were carried out, and resulted in a saving to our association of between \$400 and \$500. The association purchased \$3,820.56 worth of baskets.

It is impossible to give any idea of the good work that has been done at our meetings. Increased interest has been taken in the last few meetings held. Before our meetings open and after the meetings groups of growers



get together and discuss matters among themselves in a quiet and interesting way, which proves profitable. We expect that the coming year will see great progress made by this branch.

#### THE OTTAWA BRANCH.

*T. Mockett, Billings' Bridge, Secretary.*

The Ottawa branch was organized on April 5th, 1906, by Mr. T. Delworth, of Toronto. Mr. F. Williams was elected president. During the year six meetings were held, and thirty-nine members joined. Owing to the mixed nationalities of the gardeners in the Ottawa District and to the hesitation of the French and Germans to mix with the English-speaking classes, we have devoted a large amount of time to inducing them to join the association. Most of the English-speaking gardeners, who are the principal growers, have joined.

A large amount of time has been given to trying to improve certain abuses on the Ottawa markets, such as the restriction of hours of buying and the blocking of the markets by hucksters' empty rigs overnight, thus holding the best positions on the markets from the gardeners. Owing, however, to the lateness of the season when this matter was taken up, it was laid over until spring, but not until after some members of the market committee had been seen and their assurances had been obtained that any reasonable suggestion or plans along that line would be favorably received.

We have written also to different seedsmen regarding their putting a percentage of the germinating power on their packages of seed supplied to market gardeners. A circular letter was sent to eight, only two of whom replied that they would do it, and then only under certain conditions. The other firms replied that it would be impossible for them to test all seeds before sending out.

This is the principal work that has been done by our branch during the past few months. We have made no plans yet for the winter meetings during 1907, but now that we are organized we expect to be able to accomplish much valuable work in the future for our members.

#### THE CHATHAM BRANCH.

*Fred Collins, Chatham, Secretary.*

The Chatham branch of the Ontario Vegetable Growers' Association held five meetings during 1906, and while nothing definite has resulted, the discussions have been helpful and a better feeling prevails amongst the members. The association has discussed very thoroughly a scheme for co-operative selling. A committee was appointed to draft a plan, and has reported as follows: That we form a joint stock company on a small scale, for the purpose of disposing of our produce, this company to be capitalized at \$1,000, in shares of \$25 each. The estimated annual expenditure was placed as follows: Rent, \$200; horses, \$75; wagons, \$25; two men, \$700; manager, \$600; office and casual help, \$275; 'phone, \$25; sundry, \$100; total \$2,000, or 25 per cent. on \$8,000 of business. While some of our members were enthusiastic over the scheme, the greater number were of a more cautious disposition. During the coming year we expect to evolve a plan for the buying of seeds and other supplies on a co-operative plan, and to conduct some experiments in vegetable culture.

## THE SARNIA BRANCH.

*W. A. Broughton, Secretary, Sarnia, Ont.*

The Sarnia Vegetable Growers' Association has twenty-nine members. Ten meetings were held during 1906, which were fairly well attended. Two debates were held as a social feature, and both were largely attended, especially by young people. The subjects of the debates were "Gardening vs. Farming" and "Electricity vs. Steam." The affirmative won in both cases.

There was no co-operation in the buying of supplies for the garden or farm in our association during 1906. The members of the association agreed to raise the price of potatoes to sixty cents a bushel, which price was maintained for the rest of the season.

The members of this association were much interested in the monthly crop reports furnished by the Ontario Vegetable Growers' Association, and which were a decided benefit. The association offered two prizes of \$7.00 each for the best collections of potatoes (not less than half-bushel each variety), and for the best display of vegetables at the county fall fair. The former was won by the president, Mr. John Baxter, and the latter by the secretary.

In all of our meetings discussions took place on some subject of interest to all, such as varieties, methods of growing, protection from insects, blight, and so forth. Our finances are in a satisfactory condition.

## PRIZE ESSAY COMPETITION.

At the meeting of the directors of the Ontario Vegetable Growers' Association, held in Toronto, June 7, 1906, it was decided to offer \$125 in prizes for essays by practical growers on vegetable growing. First, second, and third prizes of \$12, \$8, and \$5 were offered for essays on the growing of each of the following varieties of vegetables. The competition closed October 15, 1906. The judges were Messrs. W. T. Macoun, of the Central Experimental Farm, Ottawa; W. C. McCalla, of St. Catharines, and A. McMeans, of the Guelph Agricultural College. The prize winners were:

"POTATO CULTURE"—First, W. A. Broughton, Sarnia; second, F. F. Reeves, Humber Bay; third, H. A. Blunden, Sarnia.

"CAULIFLOWER CULTURE"—First, A. Knight, Cataraqui; second, T. Delworth, Weston; third, J. N. Watts, Portsmouth.

"TOMATO CULTURE"—First, J. N. Watts, Portsmouth

"CELERY CULTURE"—First, J. Friendship, Kingston; second, George Syme, Jr., Carlton West; third, J. N. Watts, Portsmouth.

"ONION CULTURE"—First, T. Delworth, Weston; second, J. N. Watts, Portsmouth; third, Herbert Hachborn, Brantford.

The prize essays were read and discussed at one of the afternoon sessions of the annual convention, held in Toronto during November, at the time of the Ontario Horticultural Exhibition. The first two prize essays in each class are here published.



## GROWING POTATOES FOR PROFIT.

By W. A. BROUGHTON, SARNIA, ONTARIO.

*(First Prize Essay.)*

Judging from thirty years' experience, the best soil for potatoes is a rich, sandy loam, with six to nine inches of surface soil, that is well drained either naturally or by tile. Drainage is important. Potatoes do not thrive on land that is not well drained. Drained swamp or muck lands grow good crops. As many as 400 bushels an acre have been grown on this kind of land. Sandy lands require more manure than any other kind. Stiff or heavy clay soils do not grow good potatoes. A clay loam will grow a good crop if properly handled.

**PREPARATION OF THE LAND.** The land should be plowed and disc-harrowed in August. It should be harrowed after each rain, to keep down the weeds and to clean the land. Just before it freezes, the land should be plowed again, seven or eight inches deep, if the surface soil will permit. Land prepared in this way the fall before stands the dry weather better than it otherwise would.

As soon as it is dry in the spring the land should be harrowed enough to level it, and then 25 or 30 loads of rotten manure an acre should be put on with a manure spreader. If the land were a clover sod or second crop of clover plowed under the fall before, less manure is required. The land should be plowed, harrowed, rolled, and again harrowed lightly. It is then ready to plant.

**PLANTING.** It is best to plant potatoes, both early and late varieties, as early as possible. Some growers plant the later varieties late. This is a mistake. I have found that late varieties will do better when planted early.

The best early potatoes are Early Ohio, Early Burpee, Bovee, and Early Michigan. The best late ones are American Wonder, Rural New Yorker, Empire State, Elephants, and Clark's No. 1.

A change of seed is always desirable—that is, from one kind of soil to another. Seed potatoes should be of medium size, and cut to one or two eyes. They should be planted as soon after cutting as possible. Plant them in drills from 30 to 32 inches apart and 12 to 14 inches apart in the drills, and about four inches deep.

I use an Improved Robbins' Planter, which, in one operation, marks the row, opens the furrow, drops the seed, and covers them. The machine requires a man, a boy, and a team of horses. Planting done by the machine is better than the old way of planting by hand, for the following reasons: 1, The depth is uniform; 2, the seed is put in moist earth, covered at once, and, therefore, not so apt to dry rot on account of lack of moisture; 3, the rows can be made straight; and 4, time is saved in planting, as the machine will plant four or five acres a day. The machine has a fertilizer attachment that can be used when desired. With it 400 to 800 pounds of good fertilizer can be put in the rows. This gives the potatoes a better start and insures a better crop.

**CULTIVATION.** A week or ten days after planting, the potatoes should be gone over with a weeder, the same direction as planted, to level the ridge that is left by the planter, and to kill small weeds. This operation should be repeated every few days, until potatoes are a couple of inches high. They should now be cultivated with a cultivator every week until tops are too

large to permit cultivation. For the first few times they should be cultivated deep and close to plant, but shallower and farther from plants as they grow. Hoe them before the tops get too large. At the last cultivation hill them slightly, just enough to protect the potatoes from the sun after the vines are dead.

The vines should be kept free from "bugs" by spraying with the following mixture: Two pounds of good Paris green to 50 gallons of water. For blight, they should be sprayed with Bordeaux mixture five or six times during the growing season. Apply the Paris green and Bordeaux mixture at one application.

**HARVESTING AND STORING.** As soon as potatoes are matured they should be dug. Early varieties are usually sold at once. I have used a potato-digger for eight years, and could not now do without one. The Hoover digger is the best, as it can be used while the vines are green and heavy. In digging with this digger, 8 to 10 pickers are required. From 1,000 to 1,500 bushels can be harvested in one day if the crop is good.

The pits should be made in rows, one row for every 20 to 25 rows of potatoes, and about 60 or 70 feet apart in the row, so that the picker will not have far to carry the potatoes. The potatoes should be sorted when picked, the unsaleable ones being put into bags and carted off the field, to be fed to the hogs or otherwise disposed of.

Seed potatoes should be either pitted or stored in a cool cellar. The pits should be covered with straw, with about three inches of earth on top. When wanted for market, the potatoes should be filled into bags with a potato scoop. If they are to be stored until spring, they should be put in pits; but, if they are wanted during winter, they should be put in a cool, dark, frost-proof cellar.

The pits should be made on dry ground, so that the bottom of the pits will not be wet. They should be about two and a half feet deep by three feet wide, and any length desired. The potatoes then should be put in the trench and covered well with straw, with 8 to 10 inches of earth on the straw. When hard weather sets in, the pits should be covered with a foot of manure.

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## THE CULTURE OF CAULIFLOWERS.

By A. KNIGHT, CATARAQUI.

*(First Prize Essay.)*

After forty years' experience in growing and handling the cauliflower, I find that it requires the closest attention, from the planting of the seed until the crop is sold, to secure a good profit. With a good crop there is a good profit; a poor crop gives a large deficit.

There is a greater demand for choice cauliflowers to-day than for any other vegetable. It now requires thousands of heads to meet the demand, where a few years ago hundreds would do.

**THE SOIL.** If properly prepared, any good soil will grow a fair crop. The land best adapted to growing a successful crop is a deep, rich loam that is thoroughly drained (underdrained if possible), so that it may be easily kept loose and mellow to retain moisture in a dry season.

The land should be made as rich as possible by repeated applications of well-rotted stable manure. Mix each application with surface soil to a depth



of not more than four or five inches, so as to form a rich humus that will retain moisture even in the driest season. The fall is the proper time to prepare the soil.

**CROWING THE PLANTS.** One cannot be too careful in selecting the seed. The best is always the cheapest. If your seed merchant gives you good seed, stick to him. I have procured my seed from the same house for years, and have always received it good and true to name. My favorite varieties are: Snowball, Erfurt, and Rennie's Drouth Resister, for both early and late crop. I grow a few Autumn Giant, but find it not so sure a header, although it produces some extra fine ones.

For early crop, sow the seed early in March in a well prepared hotbed, and sow thinly. Thickly grown plants are more liable to damp off. To prevent this, the bed should have plenty of light and air, and not be watered too often. As soon as the plants are large enough to handle, they should be potted in fair-sized pots, or transplanted into a new bed, which should be prepared several days before needed. Great care is required in setting out the young plants to prevent any serious check to their growth. A stunted plant is liable to head up prematurely and is worthless. By potting the plants we get a much earlier crop and surer heads, and that means dollars. The plants can be set in the field quite early, as they will stand considerable frost.

The seed for the late crop should not be sown before the middle of May, and should be sown thinly, in the very best soil, to get good, stocky plants. These do not require transplanting before setting in the field. Late plants require watching to prevent the cabbage fly from checking their growth. Tobacco dust or hellebore, dusted on lightly while the plants are damp, is the best preventive against them. Do not set plants too small. If kept growing rapidly, as they should be, they will be ready for the field in five weeks.

Transplanting should be done on a damp, cloudy day. I find it a good plan to take up the plants the day previous to setting in the field, leaving plenty of soil on the roots, and to place them in a damp cellar. New rootlets will start. It is a great help, as it prevents wilting. They are more easily handled and the growth is checked very little.

**CULTIVATION IN FIELD.** Before setting plants in the field, the soil should be made loose and mellow by repeated cultivation, but not worked when too wet. For the early crop, I set the plants in rows three feet apart and twenty inches between the plants in the row. For late crop, rows the same and thirty inches between plants. Before planting, give the field a good dressing of wood ashes, so that it will be well mixed in soil by frequent hoeings and cultivation, which must be kept up until the crop is grown. Weeds should be kept down after plants are too large for cultivation, by hand pulling or hoeing, as the crop needs all the moisture the soil will give it.

The green worm must be kept off. Paris green or hellebore is a sure preventive. I prefer using the latter, as many customers object to the use of Paris green. If necessary, go over the field several times. Begin in time. They are sure to ruin the crop if not effectually dealt with.

As soon as heads begin to form, great care is required in tying up, to protect them from the sun, wind, and dust. Perfect heads are what we should aim to get. From them we derive the profit. The tying should be so done that it will be easy to see when the head is ready to cut. Good judgment is required. It is better to cut a little early than too late. Young, tender heads are more saleable. More are consumed if taken to market young than later. If danger from frost threatens, the leaves should be tied more closely. This will protect the heads from a certain amount of frost, say, seven degrees.

When the growing season is over, all plants that show signs of heading should be pulled and placed in the roothouse. Remove all leaves that are not required to protect the head, but leave the roots and soil that lift with the plant. Stand them as closely as possible and bank up the outer side. You will thus have nice, small heads for a long time after outside heads are done.

MARKETING. When marketing, the heads must be handled with care, so as to reach the consumer in a perfect condition. I use a crate holding three tiers, 12 in each. The crate is partly open, so that the buyer can examine the contents. For shipping, use large barrels. Wrap the heads with paper and pack firmly, so that they cannot move.

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## TOMATO CULTURE, INSIDE AND OUT.

BY JOHN N. WATTS, PORTSMOUTH.

*(First Prize Essay.)*

Successful tomato culture under glass depends as much on the man in charge as on conditions. Eternal vigilance and the exercise of good judgment on the part of the grower are more essential than strict adherence to set rules.

Strong bottom heat, plenty of light, and a large volume of pure air are important conditions. They are best secured in a large, well ventilated house. Tomatoes often are successfully grown without bottom heat, but the period of maturity is much delayed.

To make the best use of the house, two crops should be grown during the season. This will bring each crop on at a season when the expense of heating, during a part of the time, will be light. Plants for the first crop should be started as early as August—that is, if the bulk of the crop is desired for the holidays. For the second crop, seed should be sown about November 1st. The plants will then be ready to replace the first lot when the fruit is off in January.

Many growers have been well pleased with the practice of laying down the vines and allowing them to take root after the first crop is picked, and thereby forming a succession of fruits on the old plants. The plants are treated in every way as for outdoor culture till handled the last time.

GROWING TOMATOES OUTSIDE. Among the many varieties of tomatoes that are grown in the field, it is difficult to say which is the best marketable variety. Much time has been spent experimenting for the discovery of some early variety. I find that no variety gives more satisfactory results in this district, for earliness and yield, than the Earliana. The best late varieties for home use and market are Plentiful, which gives general satisfaction, but not as early as some others—Success, Perfection, Purple Dwarf, Favorite, and a number of others.

The preparation of land for tomatoes is much the same as preparing for many other crops. Many people claim that tomatoes do not need high cultivation. To my mind, tomatoes require one of the highest grades of cultivation of any vegetable that is grown for market purposes. The soil must be well fertilized with rotted manure, which should be put on in the fall. Avoid stiff, hard, clay land, as it has a tendency to spoil the crop in a wet season. Soft loam or sandy loam, well enriched, or black land, gives the best results.



My reason for advocating the use of well enriched soil for tomatoes is that the bulk of the crop is forced into a marketable size, while the moisture is in the land. Should dry weather set in before the crop has had a chance to develop, the fruit and crop will be small. Often a first-class strain of tomatoes is condemned more for the want of proper cultivation than the qualifications of the variety.

Sow the seed about the end of March or the first week in April. When the plants are three or four inches high, transplant into quart strawberry boxes. These are placed in a hotbed, with a nice, steady, growing temperature, with about three inches of soil in the bed. When the plants are all in, cover the boxes so as to prevent drying out by the sun. They are left there until the danger of frost is over.

When planting in the field, run a deep furrow with the plow, in which set the plants four feet apart each way, allowing room for sun and cultivation. Break the corners of the boxes as they are put in the furrows, and thus prevent the disturbing of the roots. Draw the soil around the plants with a trowel, to keep them in position until all are planted. Then use the horse and cultivator and complete the work. The crop will be ready for summer cultivation in a few days.

By planting in squares, it gives one a chance to work both ways with the cultivator. It thus lessens labor, reduces expenses, and increases the profit.

For harvesting, the bushel crate, such as is commonly used, is the most satisfactory package for handling tomatoes. I have stored the fruit in a cellar or roothouse for several weeks after the frost has destroyed the vines.

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## GROWING, HARVESTING, AND STORING CELERY.

By J. FRIENDSHIP, KINGSTON.

*(First Prize Essay.)*

Celery is one of the most profitable crops that the market gardener grows, providing he has land suitable for its culture. It can be grown on almost any good soil, but on some the crop will not pay for the labor. The soil I prefer is one that is always mellow, and does not get too wet or too dry. Such land is found in a hollow, where, in former years, may have been a small lake, whose bed is now covered with rich humus, 12 to 20 inches deep, with a blue clay bottom. Such soil will retain moisture, and, if properly drained, seldom gets too wet. On such soil celery can be grown at one-quarter the cost of that grown on stiff or harsh soil. On proper soil the work, from start to finish, is easily done. Where such soil is not available, the land must be made as near as it is possible by plowing and the working in of several dressings of good, rich, well-rotted stable manure. The harsher the soil the more humus is required to make it mellow. When the soil is in this condition it should be well ridged in the fall, so that no surface water can remain. In the spring it should not be worked until dry. It then should be well worked and kept mellow until planted. It is a hard job to set out from 25,000 to 50,000 celery in stiff, dry soil.

**GROWING THE PLANTS.** In growing the plants, the best soil that can be secured is necessary. Celery seed is slow to germinate, and should be kept shaded until it appears above ground. Cover the seed very lightly, and keep the soil moist, but not wet. The plants are hardy, but grow slowly. Weeds

grow much more quickly, and should be removed as soon as seen. As soon as the plants form the second leaf, they can be set in another bed, if you prefer transplanted plants. If not, they should be thinned out, so as to get strong, rooty plants. The majority of gardeners do not use transplanted plants. They prefer setting direct from the seed bed, unless they intend growing celery for summer use. For that purpose, the seed should be sown in March in a well prepared hotbed, and, when large enough, removed to another bed, setting them three inches by two inches, so as to form good plants.

There is great danger of celery plants running to seed if they receive a severe check in growth. Great care is required in the setting and growing. I have seen nearly the whole setting of early celery lost by it running to seed. Late sowing should be done about the first of May or later. Late sown seed needs the same care as early. The soil requires to be kept moist. It dries out much quicker in May than in April.

**SETTING IN FIELD.** The quickest and easiest method for setting is the best. Open trenches with a plow, four feet apart and about 10 inches deep, so that when plants are set they are only a few inches below the level. The celery does much better this way than in deep trenches, and requires less labor. I set the plants close, not more than six inches apart, so that a 30-rod row will hold 1,000 plants. By having everything in readiness a man, with two smart boys, can set out 25,000 in a short time.

**CULTIVATION.** Celery must be kept growing steadily to get crisp, tender stalks. It requires more cultivation than other vegetables. The ground must be kept loose and mellow, so as to keep up the growth and make it easy hilling up. This should not be done too soon. The plants should be allowed to grow to a fair size before the banking or bleaching is done. At this time the gardener appreciates the value of the fine, loose soil aforementioned. With it he can do his work well and with pleasure. My plan is to bank as much as I can with the horse. I use a shovel plow, which pushes the loose soil up under the leaves, almost as well as a man can do it by hand. Then two men, one on either side, with hoes 20 inches long, or scrapers, as they are generally called, shove the soil still more firmly against the plants. They work together so as to keep the plants in place. It is light work, and the field can be gone over quickly. Then leave the celery to bleach until danger of frost.

As soon as ground becomes cold, bank up the plants until covered, taking care to keep stalks straight. Before heavy frost, cover with coarse horse manure. In this manner the celery will continue growing, and, when used, will be very crisp and tender, but will not keep long.

**HARVESTING AND STORING.** For digging the crop, which should be done before a heavy frost, use the horse, and plow a heavy furrow from each side of the row. Have the plow so arranged that it will cut close to plants without injuring the stalks. This leaves them loose enough to pull by hand.

When storing leave the roots on, but remove all old or useless leaves. For long keeping, celery needs close trimming, and requires a dry, cool storehouse. Place the plants in an upright position, as close as possible, so that it will continue bleaching without wilting. For immediate use, keep the roots damp, so that the growth will continue, making that nice, crisp celery so much called for during the holiday season. The most profitable kinds to grow are White Plume and Golden Paris, for early; Giant Pascal, for medium or early winter; and Rennie's Winter, for late keeping.



## ONION CULTURE FOR PROFIT.

BY T. DELWORTH, WESTON.

*(First Prize Essay.)*

For profitable onion growing, select a soil containing rather more sand than clay, clean and free from stones and other obstructions to cultivation. The location should be cool and damp, yet free from stagnant water, either above or below the surface.

We will assume that the soil is in good tilth, having had clean cultivation and been well manured for some years previous, as an attempt to grow onions for profit would be useless unless soil in that shape was available for the purpose. Start operations in the fall by applying a good dressing of stale manure, say 40 or 50 tons an acre, and plow it under. Let it freeze for the winter without harrowing.

In spring, as soon as the soil is dry enough to work, go over it with a spring-toothed cultivator or disk harrow, and thoroughly stir and pulverize it, to get the manure well incorporated with the soil. Harrow as fine as possible, and if the soil be dry enough, finish with a planker. Then drill in the seed.

At this point there is an important question to decide. Where land is cheap and labor scarce, some growers adopt the plan of throwing the soil up in light ridges, about 24 inches apart, sowing the seed on those ridges and cultivating with a horse. For market gardening in close proximity to large cities where land is expensive, in a high state of cultivation, and rich from many years of heavy manuring, I consider that method wasteful of the land. I prefer to get the soil as fine and level as possible, and then drill in the seed in rows as straight as may be done and about 15 inches apart, using about six pounds of seed to the acre, and then cultivate with a wheel-hoe.

The selection of varieties is a matter that may be affected by local market conditions. In Toronto an onion is wanted with a bright, yellow skin and white flesh. In some cities a fair demand exists for red onions, but there is little or no demand for them in Toronto. Onion growers practically are unanimous in the opinion that, as long as seedsmen will give them a good strain of seed of Yellow Globe Danvers, they are getting the best onion on the market for ordinary domestic use.

**CULTIVATION.** As soon as the seed is up so that the rows may be seen, start the wheel-hoe. Use the flat-cutting blades, and keep them sharp. Cultivate shallow and frequently. Follow with hand weeders and clean out the rows. For this work I prefer a weeder that we make ourselves out of a table knife, heated and bent round and sharpened on both edges. Don't allow the weeds to get large. A few days' smothering at this stage will do the crop irreparable damage.

Should thinning be necessary, do it with the weeding knife while they are small. Onions do not take kindly to being loosened at the roots in warm weather. It stunts their growth. Keep the wheel-hoe going till the onion tops get so large that you cannot get through them. Then use a flat or Dutch hoe, and be careful not to cut the onion. Cultivate often and very shallow; keep the hoe sharp, and barely skim the surface.

**DISEASES AND INSECT PESTS.** The onion crop has at least two enemies that are sometimes very destructive. The first is the Root Maggot. This insect usually does its work in the month of June or early part of July.

Various methods of combatting it have been suggested, but so far no practical and reliable remedy has been found. It is usually worst in light soils. Its method of injuring the crop is too well known to need description.

The other pest is known as Onion Blight. It is a fungous disease that appears usually in August, when the onions are about half grown. It shows as patches of grayish-white mildew or mold on the foliage. The foliage turns black and dies when the blight appears. The disease spreads rapidly, a few days being enough to turn a mass of healthy foliage into a few dried and blackened tufts. Spraying with Bordeaux mixture has been tried without much success. The writer made a few experiments last summer with dry air-slacked lime and sulphur (1 of sulphur and 5 or 6 of lime), dusted over the onions while wet with dew. The results were encouraging, but not conclusive. Next year the experiment will be repeated.

**HARVESTING.** As soon as the onions begin to ripen, pull them at once. The time may be determined by pulling a few. When an onion completes its growth, the roots begin to die, and they lose their hold on the ground. The onions pull easily. Onions become spoiled for keeping if not harvested promptly. Pull and lay in windrows. Turn several times in the sun until dried. Then, if wanted for long storing, carry them in with the top that does not break off in handling still adhering to them. They will keep better when stored in that way.

As they can be topped when they are picked up in the field quicker than at any other time, those that are wanted for immediate use should be tipped as they are gathered. Never handle onions when wet. Store in a dry and cool place. Do not store in deep piles. I have kept them in good shape until April, when spread out five or six inches deep on shelves in a dry cellar.

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## EARLY POTATOES.

By F. F. REEVES, HUMBER BAY.

*(Second Prize Essay.)*

For growing a crop of early potatoes I prefer a sandy loam soil, facing south or south-east, and sheltered as much as possible from the north winds. As the majority of gardeners use green manure, it is best to plow in a good coat the previous fall. The manure thus is well rotted and incorporated in the soil by spring. If the manure is plowed in in the spring it has two bad faults—first, there is a tendency to cause the potatoes to scab; and, second, if we have a dry, hot summer, it causes the land to be too loose, and consequently dry out far sooner than it would do were the land more solid.

The potato most generally grown by vegetable growers in the vicinity of Toronto is the Ohio. The reasons for this are generally known. This variety combines two features that commend themselves to the grower. One is its extreme earliness, and another that when you start to dig, the tubers are practically all marketable. Some growers are using the Eureka. I think it is a few days later, although when it comes in it is a heavier cropper. Quick Lunch or Noroton Beauty will, I think, when more generally known, run the Ohio very closely in popularity.

Many growers start a part of their early potatoes in a spent frame, or greenhouse. We usually start ours the first or second week in March. In forcing for earliness it is well to remember that a whole potato will crop



earlier than a cut one. I prefer them the size of a hen's egg, with the seed end cut off. The potatoes should be cut to the size wanted before placing for sprouting. We usually lay boards on the bench or frame where we want to sprout them. Sprinkle about an inch of soil on the boards, place the potatoes (cut down) on the boards, as close as they will lie, and when this is done, cover them nicely with soil. The boards prevent the roots from taking too great a hold on the soil. If allowed to do this, they receive a check when taken up. Care must be taken in planting to see that the roots and sprouts are not broken.

As soon as the ground is fit to work in the spring, it should be well disked and harrowed. Shallow furrows, 30 inches apart, should then be run out. If the furrows are left open for a few days it will be a great advantage, as it will enable the sun to warm the soil. The date of planting varies in different sections of Ontario, but should be done as early as one can get on the land without packing it.

In planting, it pays to place the set right side up. If this is not done the sets that happen to fall sprout up, and thus have an advantage of fully a week over the others. This is, to a large extent, the cause of the crop coming up irregularly. When the sets are in, we go along the rows with a hoe or rake and pull sufficient soil over to cover nicely. In about two weeks the weeds appear. It is wise, then, to start the scuffler going. The scuffling should be done every week till the tops are large enough for moulding. After moulding, it will be necessary to pull out only the large weeds. Great care should be taken in scuffling not to go deep close to the rows, as if the potato roots are disturbed it means a great loss in the crop.

In growing potatoes, as in all other garden crops, insect pests and blight have to be taken into consideration. One has to get after them early and stay right with them. As far as the ordinary potato bugs are concerned, the liberal use of Paris green will keep them in check. Many growers use the pure Paris green, put on dry with a Paris green gun. Others use a solution of one ounce of Paris green to two gallons of water, put on with a watering pot or spraying machine. The best way to use it is to mix one pound of Paris green with one bushel of land plaster, or air-slacked lime, and sprinkle on the plants when the dew is on them. I like this way the best because the use of either land plaster or lime is very beneficial to the foliage, causing it to remain green and vigorous for a longer period. When this can be done it increases the yield.

The question of fighting the potato blight, or mildew, is a difficult proposition. During 1906 I tried Bordeaux mixture, using the formula as given in Bulletin No. 122, issued from the Ontario Agricultural College, Guelph, in 1902:

Copper sulphate (bluestone) .....	4 pounds.
Quick lime (fresh) .....	4 pounds.
Paris green .....	4 ounces.
Water .....	40 gallons.

The bluestone and lime were dissolved in different barrels. I used an auto-spray, and started as soon as the potatoes were nicely above ground, and sprayed every two weeks till the potatoes were ready to dig.

So far as checking the mildew, or rot, was concerned, it was a total failure. In writing this essay I have had in view the fact—which I think largely influences vegetable growers—that it is necessary to get the first crop off the ground as quickly as possible. If this can be done in the second or third week in July, it practically ensures the success of a crop of either cabbage or cauliflower.

## CAULIFLOWER GROWING.

BY T. DELWORTH, WESTON.

*(Second Prize Essay.)*

One of the first requirements in the growing of any crop is a suitable soil. For cauliflower I prefer a rich, deep loam, neither sand nor clay, but a pretty even mixture of both. While the cauliflower is sometimes grown successfully on swamp or muck soils, I would never award such soils first place for cauliflower growing. A nice, sweet upland of a soft, loamy texture, thoroughly pulverized and aerated, generally will give stronger and healthier foliage, and flowers of a better and finer texture, than will swamp soils. The plants are, also, much more liable to stem rot on swampy land, particularly in a wet season.

Cauliflower, being a crop particularly susceptible to damage by drouth, the greatest trouble on the upland is to prevent its dying out in a long-continued spell of such weather as we had in August, 1906.

Assume the soil to be suitable, if the land is fairly level, and there is not much snow, we commence operations in the winter by applying about 50 or 60 tons of manure per acre, preferably cow manure. In the spring, as soon as the land is dry enough to work properly, we go over it with a disk-harrow, thoroughly chop up the manure, break it up fine, and incorporate it with the soil.

About the middle of May plow the ground about five or six inches deep and harrow down fine. Go over it with a harrow or spring-toothed cultivator every week or so, working shallow to keep weeds from starting and prevent a crust forming and drying out, continuing this until you want to set out the plants, which with us is usually between June 20 and June 30. If the weeds have been kept down and the soil worked as described, the ground will be loose, pliable, and, even in the driest season, damp, and the manure in such shape that the plants can use it at once.

A good crop of cauliflower generally will return as much money per acre as any other. That being the case, I consider it poor policy to try to snatch another crop first. It robs the money crop. It is a safe rule in gardening that one good crop is more profitable than two medium ones.

The most popular varieties of cauliflower are those of the Erfurt type. This includes a large number of other so-called varieties, among them being Henderson's Snowball. Brill, in his work on cauliflower, pronounces it "one of the best of the Erfurt type." But our seedsmen have juggled so with the names of cauliflower that it is impossible to say much about any variety without an actual test of a sample of the seed offered. I have had Seafoam, Whitehead, Giltedge, Henderson's Snowball, World's Best, and Earliest Dwarf Erfurt growing side by side in alternate rows, and would unhesitatingly pronounce them varieties of the same type. In fact, in many cases the only difference discernible was in the name and price of the seed. I believe that the list might be made much longer with the same result; but, under whatever name it is sold, a good strain of Erfurt is, I think, the most profitable and reliable on the market. The Danish Dryweather, as I have tested it, produces a flower distinct in type from the Erfurt and not nearly so good. Buy the best seed you can get, irrespective of price.

Do not sow seed too thickly. Do not keep plants too long in the seed bed. I prefer a plant rather small, sturdy, with a stem about 1½ to 2 inches long, and the seed bed kept dry.



When ready to set out, give the bed a thorough soaking with water an hour or so before pulling plants. This will prevent loss of rootlets, and the plants will not wilt as quickly as they otherwise would.

Then go to the field and plow and harrow as fine as possible the soil on as much land as you intend to plant that day. Do not prepare any more. We plant Erfurts in rows 30 inches apart and plants 24 inches apart in rows. Always transplant into freshly stirred soil. The soil, being freshly turned, loose, fine, and damp, it does not take long to do the planting. We rarely lose plants in transplanting. We have dispensed with watering in the field. The plants take root so quickly in the fresh soil that they hardly know that they have been moved. In the last ten years we have never watered in the field. It is a very expensive and laborious job, which often does more harm than good. As soon as the plants get a start, go through them with a cultivator and hoe. Repeat every few days to keep the weeds from starting and to prevent a crust from forming on the surface. Keep this up till the cauliflowers get too large to let the horse go through. By that time the foliage will shade the ground so that cultivation will not be necessary. The flowers then will be forming and the leaves will need tying up. Do not do this too soon. Do not tie up till you have to do it to prevent the sun shining on their heads. Then draw the leaves together and tie them loosely well above the flowers. The proper stage at which to cut them will have to be learned by experience. Do not leave them too long; quality is better than size.

Sell your crop from the field, if possible. Should you have some that are not sufficiently developed, and they are in danger of being spoilt by frost, cut them off close to the ground, break off all the outside foliage, leaving just enough to protect the flower, carry in and lay on the floor of your cellar. I have had beauties at Christmas that were kept in this way.

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## CELERY GROWING.

BY GEORGE SYME, JR., CARLTON WEST.

*(Second Prize Essay.)*

In order to have good celery you must have a good strain of seed, which should always be tested the year before. I consider early celery the most profitable. The seed should be sown in the hothouse about the last week in March. If sown earlier it is apt to go to seed. Fresh soil should be put in the hothouse before sowing, with about half an inch of clean sand on top, to keep the seeds from damping off.

As soon as the seed comes up it should be well aired and transplanted. It should be planted one inch apart each way, and kept growing till it is ready to plant in the field. Before moving from the bed it should be well watered, so that the plant will have lots of root. The plants should be sorted, to get all of them, as far as possible, of the one size.

The land, where celery is planted, should be prepared in the fall. It should be of a damp nature, but not wet, and should be drained so that no water is allowed to stand on the top. Manure the land well in the fall and plow deep, leaving the land up in ridges so that it may not become sour. The land should be plowed at least twice in the spring and before harrowing. A good fertilizer may be used the last time. Harrow the land level, then use a roller or plank, to give it a smooth surface. The land should then be marked out in rows three feet apart. Each row should be tramped solid before plant-

ing, so that the roots may have a better chance to strike. It should not be plowed the last time until the plants are ready to be put out. The plants should be put from eight to ten inches apart, in single rows, as they are kept clean much more easily. Too many plants should not be put in at once. It is better to have one patch coming in after the other.

After the plants get hold of the ground they should be cultivated with a harrow-toothed cultivator two or three times a week, going narrower each time. When it is impossible to get through the rows without destroying the rootlets, stop cultivating and remove the weeds by hand or by a wheel-hoe; run lightly over the space between the rows.

When the celery is fit to sell, it should be bleached with boards not higher than the celery, because if the tops are bleached it spoils the appearance of the celery. The boards should be laid down close to the roots and raised up gently, bringing up all the stems until the top of the board becomes bound in the leaves. By this method no stakes are required to hold the boards.

Celery should not be allowed to become too white before it is cut, as the substance goes back into the root. It should be cut a little on the green side and allowed to get white while packed in a box or crate. When celery is cut for market it should be washed as soon as possible. The dirt should be removed without much rubbing, because if the outside skin is broken it becomes rusty and loses its appearance. After being washed and rinsed it should be packed in crates laid flat, reversing each row until the crate is filled. Crates holding from five to eight dozen give the best satisfaction. By this method of packing the retailer can always have the celery crisp and fresh, and can buy enough to last for a week at a time.

Late or winter celery should be sown in beds in the open air as soon as possible and transplanted into the field about July 1st. It should be worked about the same way as early celery, only it should be planted a little further apart. It should be plowed up in the fall and allowed to stay out as long as possible without getting it touched with the frost. Winter celery may be kept very well in trenches dug one spade wide and deep enough to let the celery come even with the top of the ground. Cover this with a board one foot wide. When the weather becomes cold, cover it with a litter of straw manure. The straw litter holds the frost even after the weather has become warm. Another way to keep celery is to build a roothouse for the purpose. Stand the celery straight up and pack each row with sand. About six inches up have a window or door at each end, so that at any time you may allow a current of air to pass through to dry the moisture. The bottom or ground should be of a damp nature, so as to supply nourishment to the plant. It should be kept at a temperature of about 33 degrees, and never allowed to freeze. It should be repacked once or twice during the winter, and all decayed leaves removed.

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## ONION CULTURE.

BY JOHN N. WATTS, PORTSMOUTH.

*(Second Prize Essay.)*

One of the most sought after vegetables is the onion, and one of the best varieties is the Danvers Yellow Globe. This variety has been developed and much improved of late years. Loamy land yields bountiful crops of onions after it has been enriched for a few years by liberal dressings of manure.



Most farmers have found by experience that rich soil must be had for the crop, and, furthermore, that constant cultivation and weeding must be kept up during the growing season. Our onion growers here sow the black seed in April. The ground is manured in the autumn or the spring, or, what is better, at both seasons. It is worked and thoroughly harrowed and cultivated until reduced to a fine tilth.

The seed then is drilled in in rows one foot apart, using about four to five pounds of seed to the acre. To ensure a knowledge of the fertility of the seed the seed should be put into a large glass jug about half full; then fill the jug with water, and in a few minutes all the good seed, that is of a germinating quality, will sink. and the remainder, that is sold to us gardeners as fresh, reliable seed, will be quickly identified as light seed. Those seeds that float are worthless, having lost their vitality. Onion seed should be fresh, as if it is more than a year old it usually is nearly worthless. The foregoing is a sure way of testing.

As soon as the small plants can be seen in the rows, run the wheel-hoe between the latter. Boys are often engaged to remove the weeds and stir the soil by the dexterous employment of the fingers within the rows themselves. This work is continued at greater or lesser intervals throughout the season. Our best farmers aim to "wheel-hoe" their onions once a week, not only to kill the weeds, but to stimulate rapid growth of the crop. The onions are pulled early in September, and allowed to lie in the sun for a few days.

They are turned by a stiff broom or stable brush occasionally, which removes all the loose skins and prevents any bruising of the onion. The sun's rays should be enabled to develop, on all parts of the onion, that bright straw color so much desired. Let the onions lie on the ground until cured, then draw them to the barn floor or some other airy place, and spread them thinly. Some growers market their crops in the fall, while others hold theirs for higher prices.

One dollar a bushel is deemed a fair average market price, and at that figure onions, probably, pay our farmers and gardeners as well as anything they can raise. Five hundred, or even six hundred, bushels of onions are often produced upon an acre of good Danvers land, but 400 bushels may be considered a good, fair crop.

Should the crop not be all sold in the fall, they can be stored on shelves, made of slat-work that is open enough to admit air through the bottom of the shelves. Keep them in a cool, but dry, cellar, to prevent growing, and it is beneficial to stir them occasionally.

Of recent years many gardeners have tried to grow large onions by sowing the seed in hotbeds about March and transplanting them in the open ground as soon as the land can be worked. By this method onions have been raised many of which weighed over one and one-half pounds. These win the majority of the premiums at the fall fairs. They do not, however, possess the good, keeping quality of onions grown outside from seed.

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## CITY REGULATIONS GOVERNING THE SALE OF VEGETABLES.

During July, 1906, the secretary of the Ontario Vegetable Growers' Association sent the following circular to the branch associations:

The following information has been gathered in regard to by-laws in cities regulating the buying from market gardeners or farmers by dealers in cities before a specified hour each day. This information has been obtained at the request of the members of the Kingston branch, who recently wrote

the Ontario Association stating that a by-law had been passed by the Kingston City Council preventing dealers buying from gardeners or farmers before 10 a.m., and that three prosecutions had been made. The City Clerk in the following cities were written to and asked for copies of any by-laws passed by their municipal councils in regard to this matter. The following replies have been received:

The cities of Toronto, London, Hamilton, and Cornwall have no by-laws prohibiting dealers from buying vegetables from market gardeners or farmers before a specified hour in the morning.

BRANTFORD. "No person or persons shall buy, forestall, or engross any provisions, food, or produce on the market place of the said City of Brantford, or upon any of the public streets of the said City of Brantford within one hundred yards of the said public market for the purpose of buying or proposing to buy or to inspect any such article for the purpose of reselling the same or any part thereof until after the hour of 9 o'clock a.m., between the first day of April and the first day of November, and after 10 o'clock between the first day of November and the first day of April, inclusive. The penalty for any infringement of this by-law is a fine not exceeding twenty dollars and costs."

WINDSOR. "All persons bringing game, fish, poultry, meat, eggs, butter, vegetables, grain, hay, straw, fruits, farm produce, small ware or other articles to the city for sale or other disposal before 10 o'clock a.m. shall proceed directly to the market, without hawking the same upon the streets or elsewhere in the city, and shall pay the market fee, if any, required by law, provided the vendor of any article brought within the city in pursuance of a prior contract for the sale thereof may, without hawking the same upon the streets or elsewhere in the city, proceed directly to the place of delivery thereof under such contract, and provided always that farmers and other producers may sell such articles at stores and shops within the municipality at any hour of the day. No person shall buy, sell, or offer for sale game, fish, poultry, meat, eggs, butter, vegetables, grain, hay, straw, fruits, farm produce, small ware or other articles exposed for sale or marketed within the city elsewhere than on said market place, until after the hour of 9 o'clock in the forenoon between the first day of April and the first day of November, and until after the hour of 10 o'clock in the forenoon between the first day of November and the first day of April, save as hereinbefore provided; and provided, also, that this by-law shall not affect the purchase or sale of any of said articles in a bona fide store, shop, or other similar place of business. The penalty for a breach of any of the provisions of this by-law is a fine not exceeding fifty dollars for each offence, exclusive of costs."

PETERBOROUGH. "No huckster, grocer, butcher, or runner shall on the market place or in the market building, or on any of the streets or public places in the Town of Peterborough purchase or offer to purchase any meats, fish, roots, vegetables, poultry, dairy products, eggs or articles required for family use, and such as are usually sold in the market, before the hour of 10 o'clock in the morning, and no person shall forestall or monopolize any such articles in the Town of Peterborough."

CHATHAM. "Our market by-law prohibits dealers from buying on the market for the purpose of re-selling up to the hour of 10 a.m. Dealers do not like it, but it is enforced."

ST. CATHARINES. "No butcher, huckster, or dealer, his or their servant or agent, or any person on his or their behalf, shall, directly or indirectly, purchase or cause to be purchased from any farmer or other person in the said market grounds (except beef by the quarter), any meats, fish, fruits, roots,



vegetables, poultry, dairy produce, eggs, or such articles are usually sold in the public market for the purpose of selling again, before the hour of 9 o'clock in the forenoon between the first day of May and the first day of November each year, and before the hour of 10 o'clock in the forenoon during the remainder of the year; nor shall any butcher, huckster, or dealer, his or their servant or agent, or any other person on his or their behalf, act as the servant or agent of any other individual in the purchase of any of the articles enumerated or referred to in this section for the purpose, and in the manner aforesaid, before the hours aforesaid."

KINGSTON. "No person shall be guilty of the offence of forestalling, regrating, or monopolizing within the city, of oats, meats, fish, fruits, vegetables, poultry, or dairy products, eggs or any article required for family use, or such as are usually sold in the market, brought into the city for sale, and no person shall buy any of the said articles, except for his own family use, before the hour of 10 o'clock a.m., and no butcher, grocer, huckster or runner shall purchase any of the said articles in any of the public markets, or in any other part of the city, from persons bringing such things into the city to be sold or marketed before the hour of 10 o'clock a.m., and no person knowingly shall sell any of the said articles to any butcher, grocer, huckster, or runner in any of the said markets, or elsewhere in the city, before the hour aforesaid, and notwithstanding that such articles are in any of the said instances sold or bought for export from the city, and no butcher, grocer, huckster or runner shall, before the hour of 10 o'clock a.m., in any of the said markets, or elsewhere in the city, go to any wagon, sleigh, or vehicle in which articles are exposed for sale, to bargain or offer for the purchase of or make a standing offer of a price for any article to be paid to the vendor in case the vendor fails to sell such article to another purchaser at a higher price, or shall keep back or hinder other persons from purchasing, or shall crowd or throng them while purchasing, and any butcher, grocer, huckster, or runner so doing or refusing to desist and go away, or otherwise acting contrary to this section, shall be deemed to be guilty of a breach of this by-law, and be punishable accordingly."

OTTAWA. "No butcher, huckster, grocer, or runner shall, on any pretense whatsoever, before the hour of 9 o'clock in the forenoon during the months of October, November, December, January, February, and March, or before 8 o'clock in the forenoon in April, May, June, July, August, and September, purchase or contract for, or cause to be purchased or contracted for, or offer to purchase or contract for, any of the following articles when brought to the public markets of the said city for sale, to wit: Potatoes, butter, eggs, fresh meats, fish, fruits, roots, vegetables, poultry, and dairy product, nor any other articles required for family use, and such as are usually sold in the markets, live stock and grain excepted."

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## CONSTITUTION OF THE ONTARIO VEGETABLE GROWERS' ASSOCIATION

*(As Amended During 1906.)*

## PREAMBLE.

The objects of the Ontario Vegetable Growers' Association shall be to advance the interests of the vegetable industry in all its branches.

(a) By holding an annual convention for the consideration of questions relating thereto.

(b) By co-operating in every way possible with the branch Associations hereinafter provided for.

(c) By collecting, arranging and disseminating useful information.

(d) By co-operating in promoting the educational work of the Ontario Department of Agriculture.

(e) By awarding premiums at Horticultural Exhibitions.

(f) And by such other means as may from time to time seem desirable.

## CONSTITUTION.

1. The Association shall be called The Ontario Vegetable Growers' Association.

2. The officers of the Association shall be a President, a first and a second Vice-President, a Secretary, a Treasurer, or a Secretary-Treasurer, and Directors to be appointed as hereinafter provided, who shall constitute the Board of Directors.

3. Any person may become a member by the payment of \$1.00 per annum, payable in advance, and a payment of \$10.00 shall constitute a member for life. Members joining the Association thus shall not be entitled to representation on the Board of Directors.

4. An annual convention shall be held each year at such time and place as may be designated by the Directors.

5. The Directors may appoint an Honorary President and an Honorary First and an Honorary Second Vice-President, but such persons shall not have the power to vote at the meetings of the Board of Directors.

6. The election of directors shall take place each year, at the meetings of the branch Associations (hereinafter provided for and as defined in Clause 25, governing branch Associations), the newly elected Directors to assume their duties and responsibilities at the close of the said meetings.

7. The Directors shall, at the first meeting of the Board, and afterwards whenever necessary, appoint from among themselves a President and a first and a second Vice-President.

8. An annual meeting of the Board of Directors shall be held each year, at least one month previous to the date set for the annual meetings of the branch Associations. At such meeting the directors shall prepare a statement of the year's work as outlined in Clause 11. for presentation at the annual meetings of the branch Associations.

9. The Directors, also, shall appoint from among themselves, or otherwise, a Secretary and a Treasurer, or a Secretary-Treasurer, who shall remain in office during pleasure.

10. The Directors may elect from among themselves an Executive Committee, not exceeding five members (including the Secretary), which shall have the right to conduct such business of the Association as the Directors may, by resolution, specify, of which committee three shall constitute a quorum.

11. At each annual meeting of the branch Associations the retiring Directors shall present a full report of their proceedings, and of the proceedings of the Provincial Association, and a detailed statement, for the previous year, of the assets and liabilities, and of the receipts and expenditures of said Association, and a statement of membership and such general information, pertaining to the Provincial Association, as the members of their branch Associations may desire.

## QUORUM.

12. Not less than five members shall constitute a quorum to transact business for the Association.

13. (1) At least two weeks' notice shall be given previously of each general or annual meeting, naming the time and place of meeting. Notices must be mailed to each director by the Secretary.

(2) A meeting of the Executive may be held on shorter notice, provided every member is otherwise notified and consents thereto.



## DUTY OF OFFICERS.

14. It shall be the duty of the President to preside at all meetings of the Association, decide all questions of order, and make suggestions he may deem necessary in the interests of the Association, and he shall be an ex-officio member of all committees appointed. The President shall remain in office until his successor is appointed, and he shall attend the first meeting of the new Board of Directors.

15. It shall be the duty of the Vice-Presidents to aid and assist the President. In the absence of the President his powers and duties shall devolve upon the first and second Vice-Presidents in the order named.

16. It shall be the duty of the Secretary to attend all meetings of the Association and keep correct minutes of the same; conduct all correspondence, and issue all press and other reports; prepare the report of the Executive Committee for the annual meeting; forward the list of representatives to the secretaries of the Fair Associations, and prepare for publication the annual report. He shall have the power of Managing Director, acting under the control and with the approval of the Board of Directors. The Secretary shall call the first meeting each year, of the new Board of Directors, within six weeks after the date set for the annual meeting of the branch Associations. By virtue of his office he shall be a member of each committee appointed.

17. The Treasurer shall receive and account annually, or as often as may be required by the Board, for all moneys belonging to the Association, which shall be deposited in a chartered bank approved by the Association, and he shall pay by cheque all bills and accounts that have been approved of by the Executive.

18. All receipts and expenditures of the Association for the year shall be audited before the annual meetings of the branch Associations, by an Auditor to be appointed, on the request of the Association, by the Minister of Agriculture, expenses of such audit to be borne by the Association. A true copy of such Auditor's report shall be presented at the annual meetings each year of the branch Associations.

19. This Constitution may be amended or revised by a majority of the members present at an annual meeting, provided a notice of motion of such change has been given in the notices calling the meeting, or at a special meeting of the directors of the Association called for the purpose of considering the same.

## PROVISIONS FOR THE AFFILIATION OF BRANCH ASSOCIATIONS.

## PREAMBLE.

The objects of the branch Ontario Vegetable Growers' Association shall be those set forth in the preamble of the Ontario Vegetable Growers' Association.

20. A branch Association may be formed in any part of Ontario.

21. Each branch Association shall be called The ..... branch of the Ontario Vegetable Growers' Association

22. The membership fee of each branch Association shall be \$1.00 per annum.

23. Local Associations may affiliate with, and become branches of, The Ontario Vegetable Growers' Association when they have a membership of ten, upon the payment to the Treasurer of the Provincial Association of 50 cents per member, which payment shall constitute the members of said Associations members of the Provincial Association, shall entitle them to free copies of the official organ of the Association, to free copies of the report of the annual convention, and such other printed material as may be issued by the Provincial Association, and shall entitle each branch Association to representation on the Board of Directors of the Provincial Association upon the terms defined in Clause 25.

24. The annual meetings of branch Associations shall be held during the first week of December each year

25. Branch Associations, at their annual meetings, shall appoint Directors of the Provincial Associations as follows:

(a) A branch Association having at least ten members but less than fifteen shall appoint one director, but the expenses of said director when attending meetings of the Board must be paid by the branch.

(b) A branch Association having fifteen members and less than twenty-five shall appoint one director, whose expenses, when attending meetings of the Board, shall be paid by the Provincial Association.

(c) A branch Association having more than twenty-five members may appoint one director, whose expenses when attending meetings of the Board, shall be paid by the Provincial Association, or may appoint one director for every twenty-five members of the branch, but on condition that the Association shall pay the expenses of only one Director for the branch while attending Board meetings.

(d) At all Board meetings of the Provincial Association the Director or Directors present, representing any branch, shall have the right to cast one vote for every twenty-five members of their branch.

First Annual Report

OF

# The Horticultural Societies of Ontario

For the Year

1906

*(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE.)*

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PRINTED BY ORDER OF  
THE LEGISLATIVE ASSEMBLY OF ONTARIO

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TORONTO:

Printed by L. K. CAMERON, Printer to the King's Most Excellent Majesty

1907



WARWICK BRO'S & RUTTER, LIMITED, PRINTERS,  
TORONTO.

To the Honorable WILLIAM MORTIMER CLARK, K.C.,  
*Lieutenant-Governor of the Province of Ontario.*

MAY IT PLEASE YOUR HONOR :

I have the pleasure to present herewith for the consideration of your Honor the Report of The Horticultural Societies of Ontario for the year 1906.

Respectfully yours,

NELSON MONTEITH,  
*Minister of Agriculture.*

TORONTO, 1907.



# THE ONTARIO HORTICULTURAL ASSOCIATION.

## OFFICERS FOR 1907.

<i>President</i> .....	W. B. BURGOYNE, St. Catharines.
<i>1st Vice-President</i> .....	MAJOR H. J. SNELGROVE, Cobourg.
<i>2nd Vice-President</i> .....	R. B. WHYTE, Ottawa.
<i>Secretary-Treasurer</i> .....	H. BRONSON COWAN, Toronto.

### *Directors :*

JAS. GUILFOYLE, Collingwood;	ROBT. WOODROOFE, Woodstock;	A. ALEXANDER, Hamilton;
J. T. ROSE, Brantford;	W. JEFFERS DIAMOND, Belleville;	H. R. FRANKLAND, Toronto;
	REV. A. H. SCOTT, Perth.	

<i>Auditors</i> { .....	J. O. McCULLOCH, Hamilton.
{ .....	H. A. HESSON, St. Catharines.

## DELEGATES IN ATTENDANCE.

Among the Delegates, from Horticultural Societies, who registered, were the following :—

Name of Delegate.	Society.	Name of Delegate.	Society.
W. B. Burgoyne .....	St. Catharines.	M. Dawes .....	Woodstock.
C. L. Stephens .....	Orillia.	R. Jarvis .....	Bowmanville.
C. W. Schierholtz .....	Elmira.	D. H. Price .....	Aylmer.
Wm. Hartry .....	Seaforth.	W. T. Macoun .....	Ottawa.
D. S. Macdonald .....	Kincardine.	R. B. Whyte .....	Ottawa.
S. Short .....	Ottawa.	James Guilfoyle .....	Collingwood.
A. T. Armstrong .....	Millbrook.	W. R. Woodroofe .....	Woodstock.
A. T. Rose .....	Brantford.	J. M. Dickson .....	Hamilton.
W. Jeffers Diamond .....	Belleville.	H. J. Snelgrove .....	Cobourg.
Rev. A. H. Scott, M. A. ....	Perth.	W. E. Smallfield .....	Renfrew.
Wm. Rodbourn .....	Belleville.	J. Kneeshaw .....	Hamilton.
R. Walter Brooks .....	Brantford.	C. A. Hesson .....	St. Catharines.
A. E. Boldrich .....	Stirling.	A. Alexander .....	Hamilton.
Andrew Hill .....	Orangeville.	J. Thomas Murphy .....	Simcoe.
J. G. Jackson .....	Cobourg.	J. O. McCulloch .....	Hamilton.
James S. Scaeff .....	Woodstock.		

# ONTARIO HORTICULTURAL ASSOCIATION.

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## ANNUAL MEETING.

The first annual meeting of the Ontario Horticultural Association was held in Toronto, on November 9th, 1906. The first convention of delegates from the horticultural societies of Ontario was held in Toronto in November, 1904. At this meeting a committee, composed of Messrs. H. J. Snelgrove, of Cobourg (chairman); R. B. Whyte, of Ottawa; H. R. Frankland, of Toronto; Alex. McNeill, of Ottawa; D. C. McClew, of Deseronto; J. G. Jackson, of Port Hope, and H. B. Cowan, of Toronto (secretary), was appointed to consider the advisability of forming a provincial organization to represent the horticultural societies of Ontario. This committee presented its report at a second convention of delegates from the horticultural societies of Ontario, held in Toronto on November 13th, 1905. At this convention it was decided to form a provincial organization, to be known as the Ontario Horticultural Association, and provisional officers were elected. It was the first annual convention of this Association that was held in Toronto on November 9th, 1906. Delegates were present from almost all parts of older Ontario, and much enthusiasm was evinced in the proceedings. It was the unanimous feeling of those in attendance that the Ontario Horticultural Association would prove of great benefit to the horticultural societies of Ontario.

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## PRESIDENT'S ADDRESS.

W. B. BURGOWNE, ST. CATHARINES.

I am very glad to meet you at this meeting of the Ontario Horticultural Association. Through the year that is past and the year that has preceded there have been some great changes made in the work of our horticultural societies, so far as their relation to the Government and to the Province is concerned. Some very radical changes have been made, which all tend, I think, to the improvement of our work and to the bettering of the horticultural societies of the Province.

Early in the spring a committee representing this association met in the secretary's office at the Parliament Buildings, and drafted a constitution and discussed matters relating to the future of the association. It was felt that the association should be modelled largely on the lines of the Ontario Association of Fairs and Exhibitions, which represents the agricultural societies of the Province. A copy of the constitution of that association was secured, and the constitution that is to be submitted to you to-day was drafted largely along the lines of that constitution.

The discussion that took place at the last annual convention, held in Toronto, when matters pertaining to the horticultural societies were discussed, was reviewed carefully, and it was decided to have a committee interview Hon. Mr. Monteith to ask for legislation along the lines of the resolutions passed at that convention. A committee, composed of your president, Mr. F. R. Frankland, Major H. J. Snelgrove, Mr. Jeffers Diamond, and your secretary, waited on Mr. Monteith, and presented the following requests:

First. That horticultural societies be separated in a new Act from agricultural societies, and that they receive their grants on a separate basis.



Second. That the method of distributing the Government grant be changed, and the grant apportioned to the societies partly on a membership basis and partly in proportion to the amounts they expend for horticultural purposes.

Third. That horticultural societies be prevented from expending any of their funds in connection with the work of agricultural societies.

As those of you who have examined the new law will see, all our requests on these matters have been granted. When interviewing Mr. Monteith, we informed him of the establishment of this association, and pointed out how difficult it would be for our horticultural societies to bear the expense of sending delegates to these annual conventions. We asked that societies be allowed a special grant to defray the cost of sending delegates, this special grant to be regulated in proportion to the mileage travelled by the delegates. This request has not been granted. It was pointed out by the Department that, were it granted, it would create a precedent, and that it would lead the way to all the other Provincial organizations asking for similar consideration.

This fall a committee, composed of Mr. Snelgrove, your president, and secretary, again waited on Hon. Mr. Monteith, and made two requests. First, that the Department assist your Provincial Association by making it a nominal annual grant of \$100 a year, to help defray the cost of securing speakers for the convention, and other incidental expense. Second, that the Department print a report of our annual convention, this report to be distributed among the members of the horticultural societies in the Province. It is a pleasure to me to be able to report that both these requests have been granted. We, therefore, now are free from the haunting fear of lack of necessary finances, at least, and are in a position to do excellent work in the future.

I think we can congratulate ourselves upon the improved condition of matters as they pertain to horticultural societies. We are, for the first time, standing on a platform of our own, and we are to work out, as it were, our own salvation. Any one who has followed the work of agriculture and horticulture during the past few years will acknowledge the growing importance of the work of the horticultural societies in the urban municipalities of the province, and now that our horticultural societies have been separated altogether from the agricultural societies there is a better future before us. I trust that our proceedings to-day will be harmonious, and will have very profitable results, as they pertain to the future of our work.

#### DISCUSSION ON PRESIDENT'S ADDRESS.

MAJOR H. J. SNELGROVE, Vice-President, Cobourg: I am sure I voice the sentiment of all the chivalrous members of this association when I say we are delighted to see a lady delegate present at the first annual convention of the Ontario Horticultural Association. It is with peculiar pleasure, Mr. President, that I congratulate you upon your address, and the very satisfactory way in which you have performed your duties in the position to which we appointed you at our inaugural meeting last year. Although we have not the resources at our disposal to do a great deal, yet I think we have succeeded in doing, under your presidency, very nearly all that was mapped out or expected for us to do. We have drafted a constitution which, as you remarked, is very largely modelled upon the lines of the Ontario Fairs Association, which is a very efficient and helpful association to the agricultural societies, and we trust that this central association will be equally as helpful to our associate societies, the horticultural organizations of this Province.

The constitution will be submitted for your consideration by the executive and considered clause by clause. I want to say in passing that although I am not a believer in coercion or compulsion except under the form of the Law, yet I think that every horticultural society in this province should be required to send representatives to this central convention, (Hear, hear), because we are out to do the greatest good for the greatest number, and it is only by a happy combination and co-ordination and co-operation that we can hope to succeed.

The legislature of this province grants a large sum of money to these societies, and they should, I submit, deem it in their interests to be represented at this meeting which is a clearing house of ideas, which should go down to all the associate societies through their representatives. We trust to make these meetings so profitable and so interesting and helpful in every way that it will abundantly repay these societies for the very small outlay of sending representatives here in the way of their railway fare and other small expenses. The president has referred in his address, to the deputations which waited on the Honorable Minister of Agriculture. I want to say that Ontario has been very fortunate indeed during the past quarter of a century in having remarkably able men filling the important post of Minister of Agriculture in this province. In the late administration there was no abler statesman, no man who did more for the development of agriculture in all its branches and for the creation of the wealth of this province, than the Hon. Mr. Dryden, and I am glad to be able to say, as an old Liberal, that in the present Minister of Agriculture, the Hon. Nelson Monteith, we have an equally able and progressive gentleman, who is ready at all times in the most affable and agreeable manner to meet the representatives in the great interests of his department (hear, hear), and with a keen ear to the ground he is always ready to catch any suggestion that may be made for the benefit of our societies. I will say that during the different sessions that we had with Mr. Monteith we were delighted to find that we had his cordial sympathy in the organization of this Ontario Horticultural Association, and while he did not grant us all that we asked, yet we felt that he was granting all that he was able to give, and he told us that he considered that there was a great work before this association in cultivating, among our urban populations in our towns and cities and incorporated villages, the æsthetic side of life, and that is where our great field lies. I do not wish to encroach upon what my good friend, the secretary, Mr. Cowan, will shortly introduce to your attention, but I want to give him notice before he takes up the new act, that there are one or two little things that I would like to call his attention to and ask him to deal with. One is the requirement that a society shall not expend more than one-third of its total receipts in any one of the lines of work mentioned. But what are these lines of work? They are as follows: By holding meetings for discussion, for hearing lectures on subjects connected with the theory and practice of horticulture, by holding exhibitions and awarding premiums for the production of vegetables, plants, flowers, fruits, trees and shrubs; by the distribution of seeds, plants, flowers, bulbs and trees in ways calculated to create an interest in horticulture; by promoting the circulation of horticultural periodicals; by encouraging the improvement of home and public grounds; by the planting of trees, shrubs and flowers, and by otherwise promoting outdoor art and public beauty; by offering prizes for essays on questions relating to horticulture; by importing and otherwise procuring and distributing trees, plants, flowers and seeds of new and beautiful kinds.



Since our inaugural meeting last year this act, respecting horticultural societies, has been placed upon the statute books of this province. It is our charter of rights, and I am delighted to know and to point out to you that the objects of the horticultural societies have been so splendidly enlarged. Our scope of operation has been extended by the Minister in this act, but when he required that not more than one-third of our income shall be expended in any one of these different objects, that is a limitation that possibly will be found difficult to work out. Regarding the regulation that or or before the first day of May of each year the officers of each society shall send to the Department an affidavit setting out the exact financial transactions of each society and the membership, etc., I would suggest that that should be extended until it reached the first day of June, because, speaking for Cobourg Society, it would be almost impossible for us to have our list of members completed by that date. Those are two little matters, and I think the act is almost perfect with those two exceptions that I submit to your consideration. I shall not take up any further time Mr. President; I think you have very correctly stated the work of the executive during the past year. I think that we are to be congratulated upon what we have achieved, and before I sit down I want to pay a well merited tribute to our worthy secretary, Mr. Cowan. (Hear, hear). As we all know he is one of the busiest men in the Department of Agriculture, but he is fortunately gifted with that rare genius for organization work in detail that enables him to do a great deal of work and do it well in a very short space of time. I found him very courteous and very courageous and tactful and helpful in our work during the last year, and it is a very fortunate thing that we were able to secure his services as secretary of this association. He has been a great help to us; he has put us next to the Minister and secured concessions that we hardly expected to receive at the commencement of the year. We have a great constituency to develop; we have nearly one hundred horticultural societies already organized, but until we were constituted last year they were practically without any cohesive bond of union. We are perhaps to furnish this bond of union. We have a membership of nearly seven thousand. Now, these societies, and these members, we are all prepared to admit, in most cases have not been doing all that they should have done in the community in which they operate. We want to help them by mutual advice and assistance to be more beneficial in the future, and I want to say in closing that I don't think anything fits the case better than the beautiful lines of that poet of Nature, Whittier, when he said:

"Give fools their gold and knaves their power  
Let Fortune's bubbles rise and fall,  
Who sows a field, or trains a flower,  
Or plants a tree is more than all.

For he who blesses most is most,  
And God and man shall own his worth  
Who toils to leave at his bequest  
An added beauty to the earth.

And soon or late to all that sow  
A time of harvest shall be given,  
The time the flower and fruit shall grow  
If not on earth at last in Heaven."

That is the work we are hoping to inaugurate in this province. (Applause).

## CONSTITUTION OF THE ONTARIO HORTICULTURAL ASSOCIATION.

The Constitution was then introduced by the secretary and taken up clause by clause. After careful consideration and making several changes, the constitution, as amended, was adopted, it being understood that an amendment, providing for a geographical distribution of the board of directors, would be introduced at a later meeting.

1. This Association shall be known as the Ontario Horticultural Association, and any horticultural society in Ontario shall be eligible for membership upon the payment of \$2 per annum, and the delegates from such societies only shall be allowed to vote.

2. The primary objects of this association shall be to advance the interests, promote the welfare, increase the usefulness and supplement the efforts of all horticultural societies in the province. An annual meeting shall be held in Toronto, at such time as the executive may decide, and to this meeting each horticultural society in the province shall be invited, one month in advance of such meeting, to send delegates for the purpose of discussing matters of general interest, methods of management, special features of society work, lectures and reports for educational circulation, and for making such recommendations to the Honorable, the Minister of Agriculture for Ontario as may be deemed best in the interests of all societies. Each society shall be entitled to be represented by two delegates, and any society having a membership exceeding 100 shall be entitled to additional representation in the proportion of one delegate to each 100 or fraction of 100, members over the first one hundred.

3. The officers of the Association shall consist of a president, a first and second vice-president, a secretary-treasurer, seven directors and two auditors. The Board of Directors shall appoint from among themselves an executive committee, to consist of the president the secretary, and not more than three directors, and of this committee three shall form a quorum.

4. The president, the two vice-presidents, the secretary-treasurer and the directors shall constitute the board of directors.

5. The president, or in his absence one of the vice-presidents, shall preside at the meetings of the Association, and of the board of directors. In the absence of both the vice-presidents, the members present may appoint their own chairman.

6. The officers shall be elected by nomination and by ballot at the annual meeting, for one year, and shall hold office until their successors are elected.

7. Vacancies in office shall be filled by the executive committee.

8. The Board of Directors of the Association shall have power to call a special meeting of the Association whenever they deem it advisable. Notice of all special meetings, with a statement of the subjects to be discussed, shall be sent to all societies, at least one month previous to the date of said meetings and such subjects only shall be passed upon.

9. At the annual meeting or any special meeting of the Association twelve members or delegates shall constitute a quorum for the transaction of business.

10. The Board of Directors, between the sessions of the Association, shall manage its affairs, and report its transactions to the annual meeting, and five members of such board shall constitute a quorum for the transaction of business.

11. The constitution and by-laws may be amended, revised or repealed by a majority of the members present at any regular annual meeting, provided a notice of motion of such proposed amendment has been given at the previous annual meeting. All notices of motion not given at the annual meeting shall be forwarded to the secretary not later than two months before the date of the annual meeting.

12. The executive shall prepare a programme or order of business previous to calling the annual meeting and a copy of such programme shall be sent to each society at the time notice is given of such meeting.

13. The order of business of the annual meeting shall be as follows: Reading of minutes of the previous meeting, receiving report of standing committees, receiving report of select committees, reading communications and appointing committees. The first part of the afternoon session shall be devoted to unfinished business, new business, committee reports, treasurer's statement, and the nomination and election of officers.



On motion of Major Snelgrove it was decided that the constitution and by-laws should take effect forthwith, and the secretary was instructed to notify the secretaries of the horticultural societies that they would be expected to pay an annual fee of \$2 for 1907, and send in a statement showing their membership on or before the first day of May, 1907.

## DISCUSSION OF THE NEW ACT GOVERNING HORTICULTURAL SOCIETIES.

Superintendent H. B. COWAN: It is with both pleasure and regret that I rise to speak to you on the subject of the new act governing our horticultural societies. It is with pleasure, because I feel that we have accomplished a great deal within the past few years, and it is with regret, because, before long, I expect to retire as superintendent of horticultural societies, and I believe that this is the last meeting at which I will be associated with you in my present capacity. Before I undertake to explain this new act it will be necessary for me, if you are to have a clear understanding of the act, to show what has led up to it, and I would like to trace a little of the agitation for improvement we have conducted.

When I first came into office about two years and a half ago, I started to find what was the position of the horticultural societies of the province. I found it was very unsatisfactory. I realized that there were certain lines of work that it would be well for the different societies to take up, and when I started to advocate them it became evident that there were some societies who could not adopt them owing to the peculiar situation in which they were placed. These situations were due to the act under which our horticultural societies were working, and it became evident that before our societies could do the work that we wanted them to do, and that they were organized for, we would have to get right to the root of the matter by getting everything completely reorganized, our societies placed on a more satisfactory basis and working under an act of their own.

One of the first defects I found was that our societies had no central organization. There were no persons to whom I could go, except to individual officers of individual societies, to talk to about matters relating to the work of the societies. In other words, you had no provincial organization such as this is. I should make an exception; you were, to a certain extent, identified with the Ontario Fruit Growers' Association. It was a peculiar situation. The Fruit Growers' Association owned *The Canadian Horticulturalist*, and they thought that it would be a good thing for the fruit growers if they could get the horticultural societies to take *The Horticulturalist* and thus swell their membership and its subscription list. They decided that if they were going to succeed they would have to make members of horticultural societies who subscribe for *The Canadian Horticulturalist*, members of the Ontario Fruit Growers Association as well, and also give them some representation on the board of the Association. This they did, and when I came into office the only form of organization representing the horticultural societies that I could find was that some directors of the Fruit Growers' Association were representatives of horticultural societies. I found that at some meetings of the Fruit Growers' Association they had arranged for discussions on horticultural subjects, but in most cases the horticultural societies had been neglected by the Fruit Growers and but scanty attention was given their interests. However, they had some good

representatives on the directorate of the Fruit Growers' Association in the persons of such men as Mr. Whyte of Ottawa and one or two others. That situation struck me as being very unsatisfactory, and I felt that we needed a separate organization to represent the horticultural societies. Then, you had no annual report. I had nothing by which I could find what lines of work the different societies were following. Only by writing to the societies separately was I able to ascertain what they were doing. Only a few societies, through the medium of the press, knew what the other societies were doing.

Then came the act; it was very unjust the way it was worded, as it pertained to the horticultural societies. In the first place the basis of distribution seemed to be wrong; it provided for fixed grants to the different districts and the sum provided was distributed among both the agricultural and horticultural societies. Some societies were getting large grants and other societies, doing much more valuable work were not getting anywhere near as much assistance. Another serious objection was the fact that by being associated with the agricultural societies it had created in some sections a feeling between the agricultural and the horticultural societies. In some cases the agricultural societies did their best to block the organization of horticultural societies. For instance, in the town of Cornwall they could not form a horticultural society because the agricultural society would block it and say, "If you form it, part of our grant will have to go to that society." In other cases the directors of the agricultural societies were, perhaps, a little more shrewd. They organized a dummy horticultural society, and took the grant of the horticultural society and turned it into the agricultural society. This has meant that there have been places where we needed societies and didn't have them, and other places where we had them where they have been of little use. For instance, some of our city societies have not been fairly treated. In Toronto where we should have a large and flourishing society, the society has been getting a grant of \$140. There has been in Toronto, what I might call a dummy agricultural society, a society that has never held an exhibition, and that has been drawing a government grant, and it has prevented the horticultural society getting its just grant and doing the work it should. These were some things brought to my attention when I took hold. There were, also, some defects in regard to the agricultural societies, and the minute it came to suggesting that we should make a change it became a difficult matter to move.

The first step taken was to call a meeting of delegates from the horticultural societies. That was held practically two years ago in the Parliament Buildings. It was at that meeting that the suggestion was first made that we should form an Association of this kind. It was vigorously opposed in some quarters, its opponents including directors of the Fruit Growers' Association, who did not see the need of another organization, and who said it would be duplicating their work, and so forth. The most we were able to accomplish that first year was to get a committee appointed to consider the advisability of forming such an association as this. That committee was appointed to wait on the Minister of Agriculture and draw attention to some of the defects in the act that I have mentioned. That committee met and reported to you last year, and that was when your preliminary association was established. Last year we discussed, also, the main clauses of the proposed act. Your association, as you will probably remember, endorsed most of its clauses, namely, that horticultural societies should be placed on a basis of their own, that a special grant should be made to them, that they should be separated in the act from agricultural



societies, that the giving of practically fixed grants should be abolished, that societies should, receive their grants according to what they gave for horticultural purposes and to their membership. As your president has reported, your committee waited on the Minister of Agriculture and those clauses have been embodied in the new act.

Now, as regards this new act, I do not consider it perfect and fully expect that you will be able to point out defects in it and make suggestions. We cannot change it as we can our own constitution, because it is too important a matter. Every change must be given the most serious consideration, and we must be very nearly unanimous in regard thereto. However, we want to get the views of all present on any debatable question. The outstanding features of the act I have already referred to. I presume the best way for me to do is to take up the act, possibly not clause by clause but the most important ones, and explain them. In drafting this act we kept the old act before us, and embodied many of its clauses which stand exactly as they were before. You will notice clause five says "The Minister may appoint any person or persons to inspect the books of any society." That is taken from the old act, and it was included in this Act with this object: Some fear was expressed that some societies might make out that their horticultural expenses were larger than they were and to prevent this it is possible for the Department to make an inspection of the books of any Society. In the mode of organization there is a change from the old act; in the old act it was stipulated that thirty people, where the rate-payers were two hundred or less, and fifty where they were over, could form a Society. The new clause reads as follows: "A declaration . . . the number shall be at least fifty." In drafting that clause we consulted the reports of the societies in all parts of the province and I may say I discussed practically every clause of this act with leading officers of horticultural societies and we came to the conclusion that that was a pretty fair basis of distribution. The next change is where it reads: "the first meeting of the horticultural society shall be held during the second week in January next ensuing." In the old act it is stipulated that the organization and annual meetings must be held on the third Wednesday in January. This change gives the society greater laxity and allows it to select any day in the week. In the old act it was required that notice of the meeting must be given by a placard and bills. We have left that out of this act. The next change is where it reads: "The Board of Directors from among themselves or otherwise shall elect a secretary or secretary-treasurer who shall remain in office during pleasure." That is a new clause. This system has worked out satisfactorily in connection with several of our other associations. The secretary is the man who has to take the brunt of the fighting, and the kicks, etc., and it is well to give him a free hand as far as possible. Some of the sore heads will perhaps get up in meeting and try to get even with him, whereas if the secretary is to remain in office during the pleasure of the Board of Directors, he is responsible only to the Board of Directors, but they have power to deal with him.

The objects of the horticultural societies in the main have been re-drafted from the old clauses with some slight changes and one or two additions. I would like to draw your attention specifically to the broad field of work that is provided for our societies. In the case of our agricultural societies, they were organized for special purposes but they almost every one have got down to simply holding an exhibition. We are endeavoring to guard against our horticultural societies getting into a rut in the same way. A new clause is the one commencing, "By encouraging the improvement

of home and public grounds." Major Snelgrove is largely responsible for that clause; it allows a new line of work for our societies and one which some of our societies have been already following to excellent advantage. One of the debatable points is the clause which reads, "A Society shall not expend more than one-third of its total receipts in any one of the lines of work mentioned." In the case of some of our societies there has been a tendency for them to become almost a close corporation, and to expend perhaps too much of their funds in buying plants and shrubs for their members. They have been drawing a government grant, and it has been felt that there should be some safe-guard to prevent such things being carried to extremes. In other cases societies have centred all their efforts in the holding of one exhibition, and that has been the end of their work. In various ways of that kind societies have gone to extremes. It was felt that if societies were not allowed to expend more than one-third of their total receipts for one purpose it would make it compulsory on them to undertake a wider line of work. I have been already discussing that point with some of those present. For instance, in the matter of holding exhibitions some of our societies, like St. Catharines, hold monthly exhibitions in the summer and make a success of it. The expenses in connection with these exhibitions would be taken as the regular running expenses of the society, and the money paid out in prizes at the exhibitions as the money spent for that line of work. A society is free to expend one-third of its total receipts in prizes at such exhibitions. I trust you see the point I am trying to make.

A DELEGATE: You could hold an exhibition every month and a third of the expenses each month.

The SECRETARY: No; supposing the total receipts of a society were \$300, and it held a series of exhibitions, it could expend a \$100 in prizes at the exhibitions. The expenses of the exhibitions would be counted as the regular running expenses of the society.

Mr. DIAMOND: It must be the whole year.

A DELEGATE: Would not exhibition expenses be charged to the exhibition?

SECRETARY: The expenses of the exhibition would be considered part of the regular running expenses of the society. It is left to the interpretation of the Department: that is the way I understand the Department will interpret the act.

Mr. DIAMOND: The only trouble I see is the difficulty in getting at the third in each department because the whole amount cannot be ascertained until the work is completed. In other words, you could not spend the third of your money, because you would not know what the Government was going to give you.

The SECRETARY: That is a point I will touch on a little later.

Mr. WHYTE, Ottawa: In the case of contributions from outsiders—for instance, we have a member who gives us \$55 a year for special prizes; would that be counted part of our share?

The SECRETARY: Part of your total receipts.

Mr. WHYTE: I do not think the government has anything to do with what we get from outside people. That is a donation; this man gives that money for a special purpose, and we have nothing to do with that. All the department can regulate, it seems to me, is the grant and our members' subscriptions. If we go round to half a dozen people and get a grant for our exhibition, I don't see why we should be penalized.

The SECRETARY: That is a proper question, but one on which the Department has found it necessary to take a decided stand. For instance take



horse-racing at agricultural exhibitions; a society raises money for horse-races entirely independent of the society, and claim that they can do as they like with it. The Department has found it necessary to say that no society receiving money from the Government shall hold horse-races at their exhibitions, no matter where they get the money. The principle comes in there and it is the same here.

Mr. WHYTE: Then we should not put that in the accounts at all?

The SECRETARY: Take the case of the Hamilton Society; they raise large sums of money for special exhibitions. They may hold a big exhibition and spend a large sum of money on it. Of course that is an exceptional case; and one way for that society to avoid this clause would be by having a sub-committee or a special organization to handle that exhibition leaving the horticultural society to conduct the regular work of a horticultural society. This act has to apply to the societies as a whole, and there are bound to be some clauses in it that may fall hard on a few societies.

Mr. R. B. WHYTE: We will have to decline to take this money.

Mr. DIAMOND: It seems to me we have to make an annual report, and the auditors have to audit it; it must show all the receipts during the year whether special or anyway else, otherwise we would be virtually evading the Law, and I think we cannot make an exception of that kind. We will have to make an honest report to the Government as to the money received and the money expended, no matter where it comes from.

Mr. DICKSON, Hamilton: The speaker has put the matter in a new light. In Hamilton we have had to raise a little money. One gentleman gave us \$50 to help in our prize list, and a good many more gave us \$25. If we put only one-third of our receipts into our prize list I do not see how we can collect that money. Our total receipts from the Government and our own members would not amount to more than \$525, and if we held an exhibition and went around with the hat and got these contributions from our friends they would give more than our total receipts from outside sources, and how would we be tied down with that money?

Mr. STEPHENS, Orillia: I believe that clause will knock out altogether the holding of exhibitions by horticultural societies. I do not see how it is possible with one-third of their income to hold an exhibition of any kind and give prizes. In Orillia we have carried out the act, but we have spent the greater part of our money in exhibitions.

Mr. W. T. MACOUN, Ottawa: The giving of this special prize by our Ottawa member is to encourage horticulture just as is the Government grant. He pays the winner by cheque. The individual show that wins his special prize is one of the features of our exhibitions, and if that clause stands we shall have to cut out this special feature of our summer exhibitions, five in number.

C. W. SCHIERHOLTZ, Elmira: I do not see any objection to a society raising money in that way and using it, as long as they get no Government grant and societies do not lose by money that is raised that way. If they are fortunate enough to have a few rich men in their midst who will give perhaps \$50, \$100, or \$200, and then they bring that in their report as having spent so much more money, and the Government grant will be based on that, then other societies will lose by it, but if it can be fixed that way that other societies do not lose by it, I do not see any objections to their doing that.

The SECRETARY: Here is a point: take the case of the Ottawa Society. For a number of years Lady Minto and now Lady Grey conducted Garden Competitions more or less in conjunction with the society. That expenditure has been shown up, as I understand it, in the Horticultural Societies

expenditures. In the same way Mayor Ellis has given prizes for school children's work. Has that appeared in your expenses, Mr. Whyte?

Mr. WHYTE: No.

The SECRETARY: We have a large number of societies in the province, at any rate we have two or three to which that may apply unjustly, but it is important that that clause should remain there to prevent these societies getting into ruts. In the case of these one or two exceptional societies I do not see why such conditions as they speak of could not be overcome on such lines as the Lady Minto prizes. Take Hamilton: they have another organization there that has offered prizes for the best garden, and that society has done excellent work. If that society has done that other line of work could not members of the Horticultural Societies hold a bigger exhibition and raise funds on the side independent of the society's work?

Mr. WHYTE: It could by getting them to limit one-third to the grant and members' fees. That would be fair and reasonable. What earthly business is it of any other society if a society undertakes to collect a lot of money for a special exhibition? It does not affect them, but it means a great deal to that society.

Mr. GUILFOYLE: I think we should remember that the grants paid hereafter are different from those paid heretofore. Heretofore they were only on the membership; hereafter they will be on the money obtained from all sources. The temptation will be to spend more because the grant will be greater.

Mr. REID: Could it not be arranged where societies can obtain special prizes to give them the privilege of using that money without interfering with the Government report. Let it be done in the name of the Horticultural Society; probably it would not be convenient as you suggested to have some other society handle this. They could probably do it better in every way and that should not be included in the Government report. Have that a special feature only, but handled by the society.

Mr. WHYTE: Keep the special prizes out of the Government report altogether.

The SECRETARY: I do not see any objection to that.

Mr. WHYTE: In this prize of \$75, the gentleman who gave it especially stipulated that it was not to go into our general funds.

The SECRETARY: As long as it does not appear there it is all right.

Mr. DIAMOND: I suggest, while we are discussing this, that there ought to be a special committee appointed to meet the Government on some unanimous plan. We are wasting a lot of time; we cannot alter that, and a special committee could formulate it if we can get up a unanimous report to send to the Government. I think we are wasting time trying to change an Act of Parliament.

The SECRETARY: We cannot do that until we discuss it here and get the views of the members. That is what we are trying to do.

Mr. DIAMOND: The committee could bring a report here and we could discuss it.

Mr. ALEXANDER, Hamilton: I think the whole matter is very simple; the suggestion made by Mr. Whyte just now I think covers the whole ground. The Hamilton association has collected extra money, they have had exhibitions, but every cent of money that has come into our treasury has been acknowledged to the Government, including all the extras every year. Several societies have not done this, and therefore I think that the Act in this clause about the division of the money should be taken as hinted by Mr. Whyte, that it should include a third of the Government grant and



the membership fees, that is, the regular income of every society, and I think that is reasonable, and if that were done with that there is no other alteration required in that clause—if it is understood that the third referred to there is a third of the Government grant plus the membership fee, which is the regular income of every Horticultural Society. We can have no idea at all what our income will be until we have resolved to hold an exhibition, and ask our friends to help us to get up an exhibition, to make a reasonable prize list so that the exhibition will be a success. We have always lost with our exhibitions; the last we had cost us \$200 in addition to what we collected. I think the whole morning seems to have been taken up with talk that I think could have been very well done in committee, and I think if we would agree upon that understanding of Mr. Whyte the Government would consider it.

The SECRETARY: This seems to be a clause objected to most strongly simply by city societies, and I suggest that the members of city societies get together and try to formulate something. It is important that this should not be changed as regards societies as a whole.

Mr. BURGOYNE: The act was passed after many of the societies laid out their plan for the past year. The act was not passed by the Legislature till along in May, and does not come into effect until 1907, so that it should not affect the societies' work of this year; they could not alter their plans in accordance with legislation they knew nothing about. It seems to me we could reach a conclusion by waiting upon the Government and the Department, that this clause shall not affect the grant of next year no matter what societies may have expended this year, and then meet the committee and consider the matter and arrange on some basis for the administration of that.

The SECRETARY: The next clause is: "No society shall hold an exhibition in connection with the exhibition of an agricultural society or societies." That is a clause that is taken exception to by some societies.

Mr. STEVENS: What will that mean exactly?

SECRETARY: It means that a horticultural society cannot offer premiums at an agricultural exhibition, in the same building at the same time. There are two or three reasons for that. We discussed this at our meeting a year ago and were practically unanimous on it. As past experience has shown, if there is a loophole left open, the agricultural societies are going to try to get hold of the funds of the horticultural societies. That does not mean that an agricultural society cannot offer prizes for horticultural purposes. The act for agricultural societies gives an agricultural society power to offer prizes out of its own funds for horticultural purposes, but it shuts the door to an agricultural society doing as they have done before, electing a majority on the board of a horticultural society getting its funds, and turning them into its agricultural exhibition. We want to keep the two societies distinct; let each work on their own basis.

The SECRETARY: The method of calling meetings has been slightly amended. Some places thought that they would prefer to send notices by registered letter to their members instead of the old way and we have left the way open for them to do it if they want to. In some cases the advertisements required in the past would cost a good deal more than the registered letters would; for instance, if a society finds that it would be too expensive to put an advertisement in the papers and also get out placards and bills to put around, they can send notice by registered letter to each of their members.

Mr. DIAMOND: Does that say how many notices in the paper?

The SECRETARY: No it says "Shall be given by advertisement in one or more papers."

Mr. DIAMOND: One advertisement would do?

SECRETARY: Yes.

PRESIDENT: That must be in conjunction with the placards.

SECRETARY: Yes; take a case like the Toronto or Ottawa Societies: "shall be given in one or more newspapers and also by placards." The pasting of bills around Hamilton or Toronto or Ottawa is too expensive and would not accomplish the object desired so a city society can by registered letters overcome the difficulty.

Mr. GUILFOYLE: Does the Act make it obligatory on societies to hold exhibitions annually?

SECRETARY: No; we have left out of this act the power horticultural societies have had to hold land. There are three societies in the province that are, to all intents and purposes, agricultural societies, and there will have to be an adjustment in regard to them.

The SECRETARY: A change has been made in the clause that requires that: on or before the first day of May each year each society shall make an affidavit as to its membership. It used to be the first of September. The idea in changing the date to the first of May was to make it possible for the Department to distribute the grants several months sooner. The affidavit is required to show that the society is a working society before it shall receive the grant.

Mr. WHYTE: In all eastern societies that should be June. The first of June our membership roll is complete, but by my recollection we get about a third of our membership the first two or three weeks in May.

A VOICE: It is the same all over.

SECRETARY: That clause has nothing to do with the amount of your grant or the number of your members; all it is required for is to show that you are in existence at that time and that you have the number of members required by law.

The PRESIDENT: It would be a hundred and twenty-five in the case of Ottawa?

The SECRETARY: Yes.

Mr. WHYTE: I understood that on that report our grant was to be based.

The SECRETARY: No, you are thinking of a clause that comes on farther. The Department wants to know that the society that made a report in January is still in existence, and has the number of members required by law.

Mr. DICKSON: May I ask if the number is fixed at eighty?

The SECRETARY: One hundred and twenty-five for the four cities with a population of 30,000 or over, including Hamilton.

Mr. DICKSON: This year we got notice from the Deputy Minister that we should make an affidavit of eighty members; previous to this we had not to do that. Are you changing this every three months or so?

The SECRETARY: No, every notice you got this year would be the same as those received in the past.

Mr. DICKSON: Excuse me, it is not so.

The SECRETARY: No change has been made in the old act, which is still in force.

MAJOR SNELGROVE: Section 17 (a) says this statement shall set forth plainly the number.

The SECRETARY: You are right; I am wrong here.



Mr. S. SHORT, Ottawa: I would like to ask if the Minister can over-rule the Act at any time?

SECRETARY: No. All the Minister can do is to interpret any clause in the Act, concerning which there may be doubt. He himself is governed by the Act just the same as any person else. I am wrong as regards this clause under discussion, as I see that it goes on differently to what I thought.

The PRESIDENT: That is the statement to be sent in the first of May.

The SECRETARY: Yes.

Mr. WHYTE: That is a thing we cannot do.

The SECRETARY: Mr. Dickson has put his finger on it. That statement, I take it, has an error in the date. The grant is going to be based on the annual statement presented at the annual meeting in January. This clause mentioning the first of May, I judge, must be a misprint, for on the first of May we are going to require the affidavit of which I was speaking. I will make a special note of this clause, and draw it to the attention of the Department. The clause providing that should it be found within one year of the receipt of the annual reports that fraudulent returns have been made to the Department the offenders may be punished, is taken out of the agricultural act; where we have found such things to occur.

The act provides that an amount not exceeding \$8,000 shall be subject to division annually among the societies of the province. That is an increase of about \$1,500 over what the horticultural societies have been receiving in the past. The sum has been increased, and it is well that you should understand that this is because it is expected that from now on more societies will be organized. Where, in the past, the opposition of agricultural societies has prevented their organization new societies are going to spring up. I do not expect that there is going to be any marked increase in the number, but some new ones will be organized. Your grants will probably drop in another year somewhat on that account. This increase in the total grant has been given largely for the new societies that are expected.

Mr. WHYTE: It is a pity it was not made to our interest to establish new societies.

The SECRETARY: We saw that defect, but could not see any way out of it. I expect this association, as soon as it finds the grants to the societies are becoming too small, will be able to show the need for more money. The more societies you have the more chance you will have to get an increase in your grant. When we came to decide how the grant should be divided we were up against a knotty problem. One of the first suggestions was that we should distribute it entirely on a membership basis, but we found that that would be unfair to smaller towns, because societies in cities could run up a great big membership by engaging special canvassers. Then we thought that it should be on the money expended for horticultural purposes. This, we found, might lead societies to become indifferent to increasing their membership and thus would restrict their usefulness. Then it was decided that \$2,400 should be subject to division according to the membership in the preceding year, and \$4,800 upon the amounts expended for horticultural purposes. I got a letter the other day from a society vigorously protesting against this Act. It is a society that has been holding its exhibition in connection with its local agricultural society. It describes this act as a robbery by the city societies, and unjust, and so on. I claim that if there is any unjustness about it, the unjustness falls on the city societies. Take the Agricultural Society Act: It provides \$70,000 for the agricultural societies of the province, a large proportion of which is paid by the people in the cities. Out of that \$70,000 the cities get nothing.

When we get back to the horticultural societies that are in the towns, villages and cities, a special grant of \$800 to the city societies is not their just proportion, in proportion to the amount of taxes they pay. That has been figured out carefully, and the cities are entitled to a considerably larger amount than \$800.

The PRESIDENT: Is that not a reduction from the past?

The SECRETARY: No, it is an increase. The Hamilton and Ottawa societies, and I think London, get \$350. In Toronto there has been an Agricultural Society that draws an amount of about \$400, which now will gradually disappear under the new Act, and its funds practically will come over and be part of the \$800 given to the horticultural society. The city will be getting a little more than in the past, but not much.

Mr. WHYTE: They only get more if they work for it.

The SECRETARY: Yes. There is one more change at all important, and I think it is the only one, where it states that it will be obligatory on the societies to place their treasurers under bond, and if they do not do so and anything happens, the directors will be held responsible for any funds that are misappropriated.

Mr. WHYTE: Is there any possibility of having the clause changed to the first of June instead of the first of May?

The SECRETARY: I will endeavor to have it.

Mr. STEPHENS: Might I ask for the clause providing for the organization of this provincial society?

The SECRETARY: There is no such clause, as it was not thought necessary. There is no such clause for the formation of the Ontario Association of Fairs and Exhibitions.

Mr. STEVENS: Under what authority are we organized?

The SECRETARY: Under our own authority, a voluntary association. Possibly you desire to ask me questions; now would be the time to do it if there are any more.

Mr. GUILFOYLE: I think the explanation has been clear and explicit.

The PRESIDENT: Would it be well to appoint a committee to consider the feature that caused such a lot of discussion, with regard to the one-third clause and see if we could get at a solution of that this afternoon?

Mr. WHYTE: There is one more difficulty about that third question. When we are drawing up our financial scheme for the year what are we going to do? We do not know what our income is; we may unintentionally violate that act. We are going to be punished by not getting our grant for a totally unintentional offence against the act. I think there should be a little more latitude to the individual societies. For instance, as law-abiding members of the community we are endeavoring to live up to that act, and we started last month on next year's program; we got out our premium list and are canvassing for members, and we are trying to get ready for the first of May though we would rather have it put off till the first of June. We cannot tell what our income is going to be next year within possibly a hundred dollars or two hundred dollars; we might fall short \$200 of what we expect or we might go over what we expect. If we are going to be fined by losing our grant for going more than one-third on any one feature, I think it is unjust.

The SECRETARY: I have a series of questions presented by the members of the Ottawa Society. One is, "When will the grant be subject to division?" The grant may not be divided before June, after that May statement has been sent in, but your annual statements must be in the hands of the Department within a month after your annual meeting. That



will enable the Department within a month and a half if the reports come in promptly, as we intend to see they shall, to figure out the grant about the first of March to let you know what your grant will be for the next year.

MR. DICKSON: It is the same as before.

SECRETARY: Yes.

MR. GUILFOYLE: With the exception that we never knew what our grant would be until we received it.

SECRETARY: Yes, you will know about the first of March; I am taking it for granted that the societies will report promptly.

THE PRESIDENT: A remark was made about leaving certain things out of the annual reports. I think the annual reports should include faithfully all the financial transactions of the society, and it should not be left discretionary with any society to leave out this or that or the other thing. On the faithful rendering of a report, the government could not penalize any society for the work done this year.

MR. DIAMOND: Do I understand that our annual reports for this year are to be made out in January or next May?

THE SECRETARY: In January.

MR. DIAMOND: Do I understand another annual statement to be made up on the first of May?

THE SECRETARY: That is the point I have marked to bring to the attention of the Department to have altered. Your annual statement will be presented at the next annual meeting, and your grant will be based on the statement made in January.

MR. DIAMOND: There will not be two annual statements?

THE SECRETARY: No.

MR. S. SHORT: In regard to that point about everything being included in the government report, would it not be better that each society should include these exhibitions in a side report, not in the main report covering the government grant?

THE PRESIDENT: That suggestion should be made to the Department.

THE SECRETARY: I would suggest that the members of city societies get together and work out what would suit them best and take it up with me or with the Deputy Minister. I do not want you to encroach on or invade the act, but this is the position: The Department is not going to be too drastic in interpreting that act, if it finds you are going a little bit over the limit. If the work is justifiable no exception will be taken, but if a society is going to extremes the Department feels that it should have the power to take action. Do not look on the Department as being arbitrary.

J. T. ROSE, Brantford: I may be out of order but our forces are all gathered for the school children; we gave them seeds and gave them prizes for the flowers they exhibited. We put all the money that we received into that, less our running expenses. Now, have we to take a third of that grant that we get and then use the other two-thirds for some other purpose? If we do, then we are dropping out of one of the grandest works that any institution ever took hold of.

MR. DICKSON: May I ask how much you expended?

MR. ROSE: Our Secretary Mr. Brooks, is not here at present; he has a full report of that. I am sorry he has gone out, but that has been our whole object, to get the school children, and we have got the school children. By referring to *The Canadian Horticulturist* you will see a cut of the show we had there, and it was a grand success. If you are going to bring it down to one-third you are going to cut our heads off.

MR. DIAMOND: And the children's too?

Mr. ROSE: And the children's too. I will not say anything more, because I may encroach on Mr. Brooks' words this afternoon.

The SECRETARY: If I may be allowed to say a few words in conclusion, I would like to draw your attention to what we may look to as the future of our societies. To me it seems most encouraging. The limitations with which our societies have been struggling have been removed. There is nothing to prevent their organization; there is no limit to the grant to a society, it is going to be given in proportion to the work it does. Our societies are organized; we have our provincial organization; we have a means by which we have come together to discuss these matters. The Government is going to help us; we are going to have our annual reports printed and distributed among our societies, and I feel satisfied that it is going to increase the interest of the work. Further, I feel that the future of our societies is more bright than ever before. I feel disappointed that I have not been able to do more. I wanted to get out special reports and so on, but my work has been concentrated on this act. It has been a great pleasure for me to work with you. Although I expect to step out as superintendent of societies, I do not intend to let my interest entirely cease, and I hope through *The Canadian Horticulturist* to still keep in close touch with your work and with your association. (Applause.)

Mr. DIAMOND: I move that a hearty vote of thanks be tendered to our secretary for the very able and instructive manner in which he has presented this act passed by the Government, and also for the very zealous manner in which he has so far conducted his work.

Mr. WHYTE: I have very much pleasure in seconding the motion.

The PRESIDENT: I am sure, as Mr. Whyte said, that every man would like to second it, and I ask you to second it and carry it by a rising vote.

All rose and sung "For he is a jolly good fellow," followed by three cheers.

The PRESIDENT: I cannot add anything to the enthusiastic manner in which this motion has been carried. I think you must feel that it comes from the bottom of our hearts, and we all feel that you have earned everything we have said and manifested in the way in which we have tendered you this vote of thanks. (Applause.)

SECRETARY: I can thank you from the bottom of my heart for this vote of thanks, because in a way I feel that it is a pronouncement upon my work as superintendent of horticultural societies, and I feel that I can take it as a testimonial that you feel that my work has not been in vain. I assure you I thank you very heartily.

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## THE OTTAWA GARDEN COMPETITIONS.

By S. SHORT, PRESIDENT OTTAWA HORTICULTURAL SOCIETY.

The subject I have been asked to discuss with you this afternoon is the City of Ottawa Garden Competition, their effects, and how they have been carried on. I am pleased to tell you that the effects have been beneficial, both from an educational as well as from an ornamental standpoint. Through these competitions the city of Ottawa has wonderfully improved in appearance, and is now well worthy being visited by tourists or anyone wishing to spend a day or two pleasantly and with interest. These competitions were inaugurated by Lady Minto in 1902, and carried on during 1902, 1903, and 1904.



The objects Lady Minto had in view were the encouragement of neatness and order in the keeping of grass plots and flower beds, especially where fronting the street, in the private homes of the citizens; the encouragement of flower growing and their tasteful arrangement in beds or borders, and to awaken increased interest in horticulture in general, so that the gardens and lawns entered in the competition might be object lessons to the rest of the citizens. As the gardens entered were situated in every part of the city, it was hoped that the presence of a highly cultivated and pretty garden would shame the owners of neglected gardens into improving them, and a general and uniform neatness would be the result, so that visitors, when driving through the residential parts of Ottawa, would see nothing unsightly, and could not fail but notice the charming effect of pretty flowers and well-kept lawns.

Lady Minto appointed three gentlemen prominent in horticulture and amateur gardening to act as judges for the three years. Mr. R. B. Whyte, Ottawa's leading amateur gardener, then president of the Horticultural Society, chairman; Mr. W. T. Macoun, Dominion Horticulturist, both of whom are here to-day, and Mayor J. A. Ellis, then alderman and vice-president of the Horticultural Society. The gardens were visited four times during the season—in June, July, August, and September, about the last week of each month. Points were given monthly for neatness and order, floral display, and general effect.

The competitors were divided the first year into two classes—those employing professional gardeners or outside help during the season, and those who did the gardening work themselves or were assisted by members of their own immediate household only. The amateurs were allowed to employ outside help before and on the 24th of May, but not after that date. The city was divided into two districts. Prizes were awarded to the three best gardens in each district; the remaining competitors received no awards. The prizes consisted of gold, silver, and bronze medals, suitably engraved. The second year, 1903, the percentage plan was introduced, to permit all competitors obtaining high percentages to win a prize. In the professional class three valuable medals were presented—gold, silver, and bronze—but in the amateur class all scoring over 75 per cent. received \$15 cash, and those scoring under 75 per cent. and over 60 per cent. received \$10 in cash. In 1904 the gardens were all judged together, no distinction being made between the professional and amateur gardens. Some of the competitors not caring to receive cash prizes, Lady Minto substituted medals and certificates of merit, signed personally by Her Excellency.

Being an amateur competitor for the prizes given by Lady Minto for the three seasons, I will try to tell you my experience for those periods. Having by a good margin the largest garden to cultivate and keep clean, I was under a disadvantage in comparison with others, who had only say, half a city lot to look after. In 1902, after a poor start, illness made it necessary for me to leave the city for some weeks, during which time the garden ran wild, and although efforts were made to clean up towards the end of the season, my garden, I think, scored last place. With renewed determination I entered my garden the next season, 1903. Early in the spring all the popular annuals were started in quantities, the soil well cultivated and thoroughly cleaned, but having so much space (about 325 feet in border) to decorate, I had for that space comparatively little bloom in June when the judges made their first round, so that while I scored well for cleanness and order I had no score for floral display, and therefore none for general effect. In July the garden showed to better advantage. It was free from weeds, but still wanting in flowers so that my score was still low. In August the annuals

were in full bloom, and also in September, but the grouping of the colors not being satisfactory to the judges, my score was low in general effect; and although I worked hard and kept my garden clean, the garden just got into the bottom of the prize list. Although I had not won a first place I had gotten the experience. Each month, immediately after the judges' rounds, a visit was paid to the first three gardens on the list. There I saw in June early blooming perennials, such as peonies, Sweet William, irises of different varieties, and other flowers. Notes were taken of the arrangements and the color scheme and lists of the varieties of flowers, especially perennials, which I did not grow, and these plants were installed in my own borders at the first opportunity. When the competition opened in 1904 I catered as much as I could to what I thought pleased the judges in regard to the grouping of the flowers and the blending of the colors, and my reward was one of the first prizes. Besides the honor of winning a first prize, and the distinction the garden so won in the neighborhood, there were many other advantages of being in the competition. In the first place, the garden was always scrupulously neat. We had more bloom of better quality than ever before, both for our own use and for giving away. Flowers from my garden won more prizes at the Horticultural Society's shows than in former years, nor did the competition interfere with summer vacation. Holidays were taken just after the visit of the judges in July, and I was back with a week in which to clean up before the judges' visit in August. Personally, I feel that I have received only benefit from being a competitor in these competitions, having gained a broader knowledge of, and therefore keener enthusiasm for, floriculture.

With the termination of Lady Minto's stay in Canada ended the garden competition under her name and direction. After a lapse of a year the scheme was revived again by Lady Grey. The judges appointed by Her Excellency are Mr. W. T. Macoun, Dominion Horticulturist, who, as I have stated, was a judge in Lady Minto's competition, and who is the chairman of the committee; Mr. H. N. Bate, chairman of the Ottawa Improvement Commission, and myself, as the president of the Horticultural Society. Mr. Bate acted as referee or consulting member, and did not visit the gardens with the other judges. In addition to giving 20 points each for cleanness and order, floral display, and general effect, the judges this year have given 20 points for labor and enthusiasm. We felt that that would more nearly cover the different conditions of the average garden, for instance, one competitor had only this year laid out his ground and garden. His perennial bloom was very slight. The owner himself had very little knowledge either of gardening or of the names and habits of flowers, yet he was very enthusiastic, and worked consistently throughout the season to keep his garden free from weeds and to gain knowledge. His marks for floral display and general effect were few, but in labor and enthusiasm and cleanness and order he scored high, and will win a prize. Again, one or two of the competitors started out very well, their gardens in good order, with plenty of bloom for the first two visits. Towards the close of the summer they evidently grew careless and neglected to pick off dried bloom or to freshly rake the walks and borders, so that their garden presented a staleness, which resulted in the garden scoring low in all sections the last visit, and dropping down several places on the list. On the whole, the different competitors kept up their enthusiasm during the summer, some of them remarking to the judges that they were determined to win the highest prize, evidently being quite satisfied with their work. It would have been better for them had they inspected some of the leading gardens in their neighborhood and made observations for



improving their own places, for I am afraid that they will be disappointed when the scores are announced. One garden that scores well up is situated in one of the poorer districts of the city; the houses in that block are small, detached cottages, renting for probably \$6 or \$7 a month. All the houses on that side of the street are alike. About the middle of the block is situated the house and garden entered in the competition. The house is the home of an English family; the mother and children—chiefly girls—are all lovers of flowers. Their efforts in flower growing were very successful and somewhat pathetic. The garden consisted of a little plot about five feet wide and ten feet long in front of the house and a little alleyway leading to the back yard. The flowers were grown in flower-pots, home-made hanging baskets and old iron vessels, painted green. Fuschias, geraniums, calceolarias, and other house plants formed the collection used to ornament the little verandah. During the long, dry summer these plants were beautifully fresh, always in bloom, and exceedingly attractive, so much so that they drew the attention of the passer-by from the broken gate and unpainted fence which we were told the landlord promised to repair in the fall. In the alleyway spireas and ferns flourished, and in every available corner of the back yard the different annuals bloomed to perfection, showing daily attention. The little yard was divided up, each little girl having a portion. Keen rivalry seemed to exist, and when the judges praised an individual bloom its owner showed intense satisfaction. This garden and the happiness that the family derived from it are object lessons to their neighborhood.

In the method of judging this season, as before stated, 20 points each were given for the following sections: Cleanness and order, floral display, general effect, labor and enthusiasm, making a possible of 80 points each month, or an aggregate of 320 points for the season. Those scoring 80 per cent. or over will each receive a silver medal and a certificate of merit, and those scoring under 80 per cent. and over 60 per cent. will receive a bronze medal and a certificate of merit. There were no restrictions as to professional employment this year, all competitors being at liberty to beautify their gardens and do the work in any way they wished. There were twenty-six gardens entered, seven scoring over 80 per cent. and fourteen over 60 per cent. The highest number of points scored is 288 out of the possible 320. This garden was easily the best, being the back half of a city lot. The lot ran through from one street to another. A neat but strong iron fence of an open pattern permitted a good view of the garden from the street. The owner, a middle-aged civil servant, looks after his garden himself. The garden is evidently his hobby. The grass was cut very regularly and the divisions between the sod and the flower beds were very straight and even. No weeds were to be found, either in the beds or the lawn; the flowers were planted with regard to their surroundings, only the choicest varieties were used. The flower beds were not overcrowded, there being room to rake around each plant, and no plant overhanging or laid on the grass. A bed of choice hardy perpetual roses and another of single petunias were particularly fine.

The garden scoring second place, 286 points, was one of the largest entered. A professional gardener was employed. There was bloom in great abundance throughout the season—in fact, there was overcrowding in this garden, and the bloom in many places was of a rather common character, resulting, evidently, from poor seed. The third garden, score 282 points, is owned by an amateur gardener who is one of the leading exhibitors at the horticultural shows. He is posted on and buys the latest and most expensive novelties. His garden is laid out very artistically, although somewhat disadvantageously situated on a side of a steep hill.

The judges were instructed to consider when judging the circumstances of each competitor and the size of each garden. In judging a small garden we expected a higher degree of excellence than from a larger one, and we also expected choicer varieties of flowers in gardens with wealthy surroundings than those in humbler circumstances. The gardens entered were situated in all parts of the city. Lady Grey provided a driver and a very comfortable conveyance. The time taken each visit was an average of four and one-half to five hours each month.

**EFFECT OF COMPETITION IN OTTAWA:** The inauguration of the competitions by Lady Minto awakened a new era of enthusiasm in horticulture in Ottawa. A short time afterwards the Ottawa Improvement Commission was appointed by the Dominion Government, who appropriated \$60,000 annually for the commission to spend in improving the driveways and beautifying the unsightly spots about the city.

Membership in the Ottawa Horticultural Society rapidly increased through the zeal of its directors, until this year the membership is the largest of any society in the province, and the largest in the history of the Ottawa society. Larger entries and better quality of exhibits were a feature of the society's shows. Flower seeds and printed instructions on how to grow them were distributed to the school children of Ottawa by Mr. R. B. Whyte and other patriotic citizens, who also donated prizes in the autumn for the flowers grown from the seeds distributed. The school trustees sodded and ornamented the grounds around schools that before were ugly and bare. A general love of flowers has been developed among the citizens; florists' establishments have doubled in number in the last four years; market gardeners who formerly grew only small fruit and vegetables are now growing large quantities of flowers, chiefly sweet peas and asters, to sell at the market at a greater profit than the vegetables. Beyond a doubt a scheme of this nature commends itself to the benevolence and public spirit of any citizen of any city or town, no matter what the size, for his or her philanthropy could not find a better channel. The deep thanks of the citizens of Ottawa are due to Lady Minto for the inception of the Ottawa garden competitions, and to Lady Grey for reviving them.

Before closing I will quote a paragraph from a letter recently written by Mr. William J. Hogan, editor of the *Wilmington Star*, to a friend, after returning home from a visit to Ottawa last summer: "The parks and park driveways of Ottawa are simply beyond description. While driving among them one becomes lost in a maze of beautiful flower beds and unique rustic-work houses, arbors and bridges, only to wind up at the Experimental Farm. This is a large tract which the Dominion has beautified at enormous expense, where expert horticulturists experiment with all kinds of fruit and vegetables for the benefit of the people of the Dominion. There are many cities of 80,000 population in the United States, but it is doubtful if any of them can be said to be slumless. This can be said of Ottawa, Canada, stands out in my mind as 'Ottawa the Beautiful,' pre-eminent among all the cities on this continent, and this is saying much when we consider 'Washington the City of Magnificent Distances.'"

**THE PRESIDENT:** I am sure we have been all very much entertained by the paper which Mr. Short has read. We have some time at our disposal before the next item comes up, and no doubt some of you would like to ask some questions and have a discussion upon this important feature of the Horticultural Society work. I felt myself like asking how many entries you had each year.



Mr. SHORT: Twenty-six this year. Mr. Whyte, who was a former judge in the Lady Minto competitions, will be able to tell you how many then.

Mr. WHYTE: Twenty-five to thirty each year.

Mr. SHORT: I brought with me the certificate of merit given by Lady Minto, and which I was fortunate enough to win the last year, and also the medal, so that the members here could see it if they so wished. I should like to say that Lady Minto invited the competitors to Rideau Hall, and there presented, and very gracefully presented, these prizes, and afterwards entertained the members.

The PRESIDENT: Unfortunately we have only one Lady Minto or one Lady Grey at a time in the Dominion. It would be very nice if we had philanthropic citizens who would devote a sufficient amount of money to enable awards of this kind to be given. In Hamilton they have a Local Improvement Society, which has a garden competition each year.

Mr. WHYTE: I may be excused for saying a few words, as I had considerable to do with the Minto garden competition, and I would like to say a little on the mode of awarding the prizes. In the first competition naturally there was a good deal of the spirit of competition evolved, as there were only three possible prizes for each grade of competitors, and it happened that between the third and the fourth there was only a matter of some two or three points, and it did not seem fair to Lady Minto that a person who had worked just as hard and had practically done as good work should have no recognition. That is the reason why it was changed the second year, so that those who got a certain percentage should get a prize, and the third year she thought everyone who had a certain percentage should have a prize or an equivalent, so that is why she evolved the medal system. She told me in a letter from England that they had just had their competition among the tenantry, and they had gone on that system and it had worked admirably; everyone who had put forth the same effort got the same recognition. There was no jealousy, because they all got recognition, and that was the reason why she introduced the scheme the third year, and the same scheme has been carried out this year, and I think that is by far the best way. It is doubtful if it is wise to publish the score of the winners. She was very anxious to avoid any idea of rivalry or jealousy. It came out in this case, though, that certain people had got the greatest number of points, but I think it is on the whole better that those who are prize winners should all appear on an equality, and that there should be no distinction between first, second, and third. I think that would be found the best scheme. As to the expense, I do not think there is a decent sized town in this province that could not raise, say \$150 for a scheme of that kind. They never could spend money to a better purpose; it would encourage decoration and beauty of houses in the city, and \$150 would go a long way in buying medals and certificates. I may say that it was by my suggestion that Lady Minto had that certificate signed by herself. I thought, and my fellow-directors thought, that there was hardly anyone that would not appreciate having a certificate like that, that they could hang in their house and frame, and show to their children afterwards that they had obtained the distinction of having a prize garden. I think my fellow-judges will bear me out in the fact that that was one of the best features in the competition, the awarding of those certificates. Last year there was a first-class certificate. Mr. Short's certificate read: "Lady Minto Garden Competition, Ottawa, 1903. First class certificate, awarded to Mr. Short. Judges, R. B. Whyte, W. T. Macoun, J. A. Ellis. (Signed) Mary Minto," with the little quotation: "The flowers are nature's jewels, with whose wealth she decks her summer's beauty."

I think that any society undertaking that work would find it a great addition to give a certificate of that kind, signed by the mayor of the city and by the president of the society and by the judges. It is a record that anybody would be proud of, and it adds very much, I think, to their interest in the competition. As to the results, of course we did not obtain all the results we would like to see, but that we obtained good results there is no doubt. I can recall several competitors that started low down in the list, but before the last year they had got away up to the top, and that is the best criterion we can have of its success. Some of the gardens that entered in the first year but did not get into the prize list are now show gardens, and the result was not only a benefit to the individual competitors, but to all their neighbors a great advantage indeed.

Mr. MACOUN: I have been chairman during the past season of the Lady Grey competition, and I would like to say a few words regarding it. I think the points mentioned by Mr. Whyte are very important—that is, that the prizes should be made on certain percentages. After our three years' previous work, we found that this year the gardens were in a much more satisfactory condition than they were before, because a large proportion of these, probably half, were the same gardens that were entered in previous years, and as a result of that I may say that in this year's competition, although the details have not been made public yet—they are in the hands of Lord Grey at present—there are about seven gold medalists, fourteen bronze medalists, and only five who receive certificates only. So you see it is a large proportion of the gardens that are getting first and second place, and I think that is the way in which a garden competition should be started—at any rate, so as to encourage just as many as possible to work in their gardens. I might say that we had a very nice letter of appreciation from Lord Grey quite recently, congratulating us on the result of our work this summer, and in that he impressed on us the importance of having those in the competition enthusiastic in their work. Now, in Ottawa this year we had the driest summer in my remembrance, and yet enthusiasm was kept up among those who entered in the competition throughout. There was only a very small number who lagged, and as a result the gardens were kept in fine condition all summer, whereas if there had not been a competition of this kind I am certain they would have been dead and dry.

A DELEGATE: Can you give us some idea of the basis on which you score?

Mr. Macoun: I was just too late to hear Mr. Short's paper, and I do not know what ground he covered, but we had for each month a maximum of 20 points for floral display, 20 points for neatness and order, and 20 for general effect, a total of 60 for each month. We found that that worked fairly satisfactorily, but we felt in beginning the work this year that there were some other things that should be taken into consideration, some things that are not quite definable, and we covered the ground under "labor and enthusiasm," so that we would have a little to go on in each direction, so that at the end of the year in summing up our points we could adjust them. For instance, if after summing up our points for the season we found that the gardens did not stand just the way they should do, taking a general estimate of the season, we could work on the 20 odd points for labor and enthusiasm; and put the gardens in their proper places, and we found that it worked out very satisfactorily indeed.



## GARDEN COMPETITIONS IN HAMILTON.

The PRESIDENT: We have with us this afternoon Mr. J. O. McCullough, president of the Hamilton Horticultural Society, and, although the garden competition has been undertaken in his city by the Local Improvement Society, he might give us some valuable information.

Mr. McCULLOUGH: The Horticultural Society has never attempted a garden competition, but the Improvement Society has, and we have seen the results in the poorer portions of the city. Mr. Whyte spoke of the elimination of competition. At the same time I think competition has done a great deal of good in Hamilton, where there were only probably three prizes given. What was called the *Spectator's* Garden Competition, got up by the Improvement Society, was in some of the north end streets, what we call the worst part of the city. When we started in there there were only a few fronts fixed up; now you could go down whole streets where every one of them are in order, everything kept in order, and it is simply competition and striving to do a little better than one's neighbor is doing that has caused it. Not that I object to appreciating the effort of everybody, but at the same time there is a danger, if everybody is going to get a certain prize, that the standard may be slightly lowered.

Mr. ALEXANDER: I have been connected with the City Improvement Society of Hamilton since its inception, and we believe that a great deal of improvement has taken place, especially in some of the lower class streets—that is, streets that were utterly neglected before. We took the precaution some years ago of offering prizes to a considerable amount to certain sections of the city that we saw required improvement. We would take a section comprising perhaps five or six streets abutting on Main Street, and we found that the change was simply marvellous. This was especially so in the street called Smith Avenue, which fortunately had no fences in front of the houses, and we got an effect there, on both sides of the street, in two years that was simply surprising. The men, who nearly all owned their own houses, straightened their lawns so that one corresponded with the other in level and all reaching the street at the same level, and in addition to that had flower beds and decorations of various kinds, flower boxes in the windows, etc., so that you would really not have known the street after two years' trial. We carried that on in other parts of the city, and the consequence is, as has been stated by Mr. McCullough, that quite a transformation has taken place in streets and in front of the houses that had been utterly neglected before. Of course, we all know that when a man takes special care with his farm or garden that whether his neighbors on each side of him have any inclination that way or not, they are driven into it from sheer shame in seeing the contrast between their neighbor's well-kept garden and lawn and their own. The first year of our existence as an improvement society in Hamilton we confined ourselves largely to the effecting of improvements visible from the street. Once or twice, however, we also gave prizes for the best kept back yards and gardens generally not in view from the street, and that also had a general effect in improving a great many of the back portions of many of the streets of Hamilton. Photographs of those have been taken in some cases, and the contrast is very marked. We found that the societies seconded our efforts without very much persuasion, and since we had been in existence two years it was so manifest that improvement was being made that we always got all the money we wanted and had no trouble at all. One or two individuals would go out and see their friends, and we got all that was needed for the purpose. We have not done anything this year, advisedly so, because

we wanted to see if we had educated the citizens sufficiently high that they would do the thing not from any desire of a prize, and we found that the good work has gone on without us offering any special inducement. (Hear, hear.) That, of course, should be aimed at throughout, because if it is a yearly thing, some people, we can understand, would continue doing so just for the sake of the money prizes. They were not all money prizes, however; we had several gold medals that had been given, and these were distributed also. We are quite satisfied with the plan that has been adopted in the city of Hamilton. Perhaps it could be improved—no doubt it could—and in the course of another year I think it is the intention of the society as a society to launch out perhaps in something different. We have given prizes for rockeries, also. You will know at the corners of streets, often, however nicely a man may keep his lawn, unless he had a fence—and we have gone for the taking down of close fences especially—he will have a pathway right across his lawn, going from one street to the other at right angles to it. Not only for the sake of decoration, but also to somewhat checkmate this matter, we offered prizes for corner rockeries. These were built of water-worn stones, and where they have come from I cannot tell. I am surprised at the quantity of that beautiful stone for rock work that was scared up as a consequence of our offering prizes for it. They are generally built up and filled in with good soil and flowers planted, flowers of trailing variety and others, so that even the corners of our streets have been beautified thereby. That and offering prizes for window boxes, as well as the keeping of the front gardens and back gardens, has constituted the work we have gone into. I may say we divided the city into sections, and very early in the season we appointed two judges for every section. They were supposed to go at least once a month from June to October, and the judging was done by these two judges. There was nobody to review their work at all, but they handed in their report to this society, and we had a meeting in the City Hall; and I may say the Council Chamber of the city of Hamilton was on these occasions filled to its utmost capacity, showing the interest which the citizens took in this matter, so that we have reason, I think, to feel satisfied with what has been done by the City Improvement Society. I have great faith in what a city improvement society can do in a town, either big or little. It was with the City Improvement Society of Hamilton that the idea originated of having a boulevard along the brow of what we call the mountain, the escarpment there; the idea originated at one of the first meetings. Although it has not been fully accomplished yet, it is in a fair way to be accomplished when the citizens of Hamilton and the strangers who come there will be able to walk along the top of the escarpment and get a view of the valley below the whole distance of the city. If I had thought I would be expected to speak I might have had a few more statistics. I regret very much that Mr. Steele was not here, who has really been largely the Improvement Society in his own person. (Applause.)

J. KNEESHAW, Hamilton: With regard to Smith Avenue, the first year of the City Improvement Society I was one of the judges on that avenue, and there was not one place there on that avenue to which we could award a prize by any stretch of imagination.

Mr. SHORT: In our travels over the city performing our duties there was a phase of civic improvement which presented itself to us, over which we have no control unfortunately, and that is the size of the building lots of the average city, or at least in Ottawa any way. The building-lots are far too small; there are numbers of the citizens who would have taken part in this competition and who would be members of the Horticultural Society had they had sufficient room to engage in floriculture. While we cannot do



anything in this respect, I wish we could bring pressure to bear on land companies or sellers of lots that they would apportion lots of sufficient size to enable the owners to have a flower garden.

Mr. McCULLOUGH: In speaking of apportioning the lots, there is a new survey laid out in Hamilton by which every man must hold forty feet. The conditions of the sale of the lot are that he shall build one house on forty feet and no more, and he must hold forty feet. That is a new survey laid out within the last three months. When Mr. Alexander was talking about the back garden I could not help thinking that beyond the back garden there is something else, and that is the alleyway, and the alleyway is not usually as well kept as it might be, but Mr. Steele has what we call a model alleyway in Hamilton. All the residents with their property abutting each side of that contributed to gravel that alleyway and keep it clean. That alleyway is simply like a carriage drive all through, and is kept that way all summer, and we hope to see a great many more like that before long.

Mr. W. T. MACOUN: There is a question with regard to the small lots that Mr. Short brought out. In the garden competition there is difficulty in judging gardens which range in size from one acre down to half a lot, and we had that difficulty this year. We had the difficulty of judging gardens that had professional gardeners, and judging gardens on half or three quarters of a lot where the work was done by the family without much knowledge of gardening, but who were bubbling over with enthusiasm, and I am glad to say that some of those who got the highest awards in the bronze medal class were among the smallest of these gardens. We tried to be as fair as we could, taking everything into consideration; and, as I say, some of these smallest gardens are near the top in the bronze medal class from the fact that they were the people who were very enthusiastic and had their gardens looking just as well, almost, as possible under the circumstances. There is the great advantage of judging on a basis of points. If you have only three prizes it is almost impossible to give one of those prizes to a small garden; the public would not understand it at all. But by having some 60 to 80 points for second prizes and 80 to 100 for first, a certain number will get it, and you can include in that a number of small gardens as well.

A DELEGATE: What are the points?

Mr. MACOUN: For the silver medal, 80 to 100; and bronze medal, from 60 to 80.

Mr. DIAMOND: Would you not think it would be advisable to classify by sizes of lots and give awards the same as we are scaled in the grant from the Government here? A person that has a hundred foot lot in front and the other has only twenty-five—

Mr. MACOUN: It is all right if you have enough gardens.

Mr. DIAMOND: You are getting money from the Dominion Government. You should be able to divide up with the people who have a small lot. My idea is you should equalize it in that way.

Mr. MACOUN: Where you have only a small number of gardens it would be especially difficult—in small places.

Mr. DIAMOND: It is not fair for a little fellow to come up against a big fellow.

Mr. MACOUN: If he is doing the best he can he should be encouraged the same as the other.

A DELEGATE: Do you ask for entries for competition, or how do you find it?

Mr. MACOUN: Yes, we ask for entries before a certain date.

A DELEGATE: Is there any entrance fee?

Mr. MACOUN: No.

Mr. ALEXANDER: I might explain that we get rid of the difficulty of the relation between a small and a large garden by excluding strictly every garden, every person, who could employ a man to keep the garden. We confined ourselves to places where the man had to do his own gardening, the cutting of the grass, etc.; we took no notice of places on residential streets where the parties always kept the gardens well by employing a gardener; we offered no prizes for these. To make an entry they had to say that they were going to compete very early in May, and the judging commenced the following month.

Mr. MACOUN: We had examples of that this year. We have overcome that difficulty, I think, almost entirely by taking everything into consideration. We found gardens this summer that had gardeners all the time that were a discredit to the people who had them, where they would spend 25 or 30 cents in the cheapest seed that could be got in ornamenting their garden, whereas the people who had no gardener at all would get the best seed and make the best show possible. I think by taking everything into consideration it is easy to overcome that. The difficulty is, in smaller cities especially, you cannot get enough people into the thing to exclude anybody.

Mr. WOODROOFE, Woodstock: Do I understand Mr. Alexander to say that they exclude anyone who employs help; that it is confined entirely to those who do their own work? There are three classes—there are those who employ hired help; there are those who do the work entirely themselves; and there are others, like myself, who, while perfectly willing to do the work themselves, cannot do it all, and employ a certain amount of help. I understand those would be excluded from the competition in Hamilton.

Mr. ALEXANDER: Oh, yes. We did that because our object was to improve places that were not improved, and we went so far as to offer a special prize for the ground around newly built houses. You know, some of you, the rapid progress made in Hamilton by the influx of population, which has necessitated the building of a great number of new houses, and we noticed that sometimes houses partly finished, and some of them finished, lay for months with brick and mortar and refuse lying around. To get rid of that nuisance we offered prizes for that, and you would be astonished to find the result of people hurrying up, the moment they occupied the house, to get the grounds cleared up. We had no trouble about it; we never found that people who engaged a gardener to keep their places right offered to compete.

Mr. McCULLOUGH: It seems to me the great difficulty in judging them all alike would be that you could not get the amateur who did his own work to go into it at all if he knew he was going to come into competition with the man who hired a gardener. That is what we found in Hamilton; it would be impossible to get the small man, the man whom we were trying to reach, to go into it at all if he knew he had to compete with a man who employed a gardener. On the other hand, I think myself it would be a very good idea if we could exempt, for instance, grass-cutting or something like that. Very often a man has his garden and takes great interest in it, but he does not cut his own grass. I think that was done once in Hamilton, but I am not sure. If we could say to a man, "You can hire a man to cut your grass, but you must do all your floral work," we would keep both classes.

Mr. WHITE: Ottawa is not pledged to any class. The man who took the highest prize last year was simply an amateur who had no help except his



sisters. He had not a very big garden, but it was most beautifully kept, and he was interested. Really, it is not so formidable an objection as it appears at first sight. As a rule, men who are hired as gardeners are not very artistic gardeners; they are generally laboring men more than gardeners.

Mr. DIAMOND: You would not want to say that to the men.

Mr. WHYTE: No; but we find that some of the very best gardens were just as well kept and just as beautiful. I think, on the whole, the most beautiful garden was this amateur garden.

Mr. DIAMOND: I believe in competition, in everything pretty nearly. It has been recognized in all the horticultural societies, I believe, that prizes have been given for professional men and prizes for amateurs. Now, I believe that is a proper mode to act upon, because we know a professional man is devoted entirely to the profession of horticulture, or floriculture, while the amateur is trying to get that education which the professional man has, and it must be by experience, and he has got to work a good deal harder than the man who is in the professional business. The professional man has everything to provide for his flowers—he has his houses and everything else; the amateur, if he raises a flower, has got to do it in a very different manner unless he is well off and has a greenhouse. But I believe in competition, and it has been recognized, I think, as I say, in all horticultural societies in giving prizes, and I do not know but in your association here to-day a professional man is awarded more than an amateur in certain lines because an amateur cannot raise all the plants and keep all the flowers that a professional man can. While this is a matter of opinion only, and we cannot arrive at anything very definite except in expressing our views, I am glad that the discussion has taken place, because it gives us a variety of ideas, and I presume each society will do the best they can; but I must draw your attention to one fact, that the Civic Improvement Association is quite a different thing from the Horticultural Society. They, of course, start out to beautify certain spots in their city which nobody else does, and it is either by civic employment or by an association; they devote their attention to that specific purpose. There are no prizes awarded in that case as I understand it; it is simply to beautify the city in which this society exists. The Horticultural Society, under the present Act, has full power and authority from the Government to do the same thing. They are going to do the best they can, and I am glad the discussion has taken place.

Mr. JARVIS: I represent the Bowmanville Horticultural Society. I am a delegate sent here by that society, and as the members from Ottawa and also from Hamilton have been speaking of prize competitions in their cities, we are contemplating the same line of work now under the new Act, although we have never done it at all. What I wanted to ask is whether the judges and committee on these competitions receive any remuneration for the work done by them?

The PRESIDENT: I think not, generally speaking.

Mr. SHORT: Nothing whatever.

Mr. McCULLOUGH: Nothing whatever.

Mr. KNEESHAW: There is one further point, and that is to say that while we awarded prizes exclusively to amateurs, we gave certificates of merit to large gardens who employed gardeners, so that they were better pleased with that than with any other prize.

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## HOW TO INTEREST SCHOOL CHILDREN IN HORTICULTURE.

J. THOMAS MURPHY, Secretary Simcoe Horticultural Society, Simcoe, Ont.: I am not prepared to say much on this subject, for the reason that, although secretary of our society, it is work done through a committee. Unfortunately at the time of holding the shows I am here in Toronto attending the Executive Committee of the Fairs Association, so that I am not able to see the working of it. The thought that was with us in getting the school children interested was, of course, to improve in a way the appearance of the town as regards the beautifying of it in the lawns and also in the gardens. The course we pursue is this: We buy a certain amount of seeds and give it to the school teachers, who distribute it to the pupils of the public school. The public school is divided into two divisions; I think we have some eight divisions in the public school; the first, second, third, and fourth divisions are the junior ones, while the fifth, sixth, seventh, and eighth are the more advanced. We buy the best seeds we can procure. We procure these seeds from the best growers that we can find. I think the first year we spent only about \$5 in seeds. We held a little exhibition in the Drill Shed, in close proximity to the school, and in the afternoon the flowers were placed and judged while the children were in school, and by the time school was out it was ready for inspection by the children. In the evening our 39th Regiment Band very kindly turned out, and gave us some music, and the public came to see it. Last year—1905—we increased the amount of seeds we gave. We found it was very encouraging to the children; they took quite an interest in it, and it was astonishing to see how deeply the little tots became engaged in it, as anxious as the old growers that exhibit at the fairs of the horticultural societies. We gave about \$10 worth of seeds, I think, last year, and we had the same program—that is, the flowers were placed and judged in the afternoon and then in the evening the band played again, and the public were invited, and just a plate placed at the door. We realized out of the contribution that evening \$15.75. After paying the expenses of that fair, which amounted to \$5.75, we got the \$10 back that we paid out for the seeds. We had asters, white, six; there were twenty-one entries in that in the junior division, also in blue or purple there were twenty-three entries; Asters, mixed colors, six, there were twenty entries; nasturtiums, twenty-one.

Mr. WHYTE: How many children got Aster seed?

Mr. MURPHY: Well, that was kept by the committee. Just as I say, I had not the working of this; it was done under the committee.

The PRESIDENT: There would probably be more than a couple of hundred in a town of your size, perhaps 200 packages of seed?

Mr. MURPHY: Yes; but they did not give them to every pupil; they exercised some discretion.

The PRESIDENT: It would not exceed that number?

Mr. MURPHY: Nasturtiums, mixed, twelve; we had twenty-nine entries. The total entries in 1905 amongst the school children, —just the public school—were very nearly 500, so that we had a very creditable display; in fact, it was a beautiful display. There is no getting around it, and the children were very much interested. This year we suffered from the drouth; we had a six weeks' drouth, and we did not expect to have as good an exhibition as last year, and, of course, we did not. The drouth came at the time when these plants needed the rain, but still we had quite a number of entries. In Asters, white, six, we had thirty-seven entries, so that there was an increase over last year. Then we had thirty-eight colored Asters, six, and so on. The entries this year came to not quite 400. We had forty-two



entries in a collection of annual flowers. In Asters, white and colored, in the second division, thirty-one entries; forty in colored Asters. We have got the children interested now. We realized about \$15 again this year by the collection at the door, and instead of recitations and the band, the same as last year, we had the band and just a few addresses from the resident ministers and two principal persons in the town. Of course we find that it is creating competition between the children, and we find, also, that our gardens are improving in appearance; not only that, but it is improving the lawns, especially in the forepart of the dwellings, and the appearance of the town is very much improved in the last two or three years.

Mr. GUILFOYLE: What date do you hold this summer exhibition?

Mr. MURPHY: It was in September, just the time of the Toronto fair, the second week in September.

Mr. WHYTE: Were any instructions given to the children on how to treat the seeds or how to grow the best flowers?

Mr. MURPHY: Well, I could not say as to that. I suppose it is likely, because the chairman of the committee, Mr. Johnston, who was formerly secretary of the Horticultural Society, is quite a good amateur gardener, and I think at the time of the distribution he has given some of those instructions to them. (Applause.)

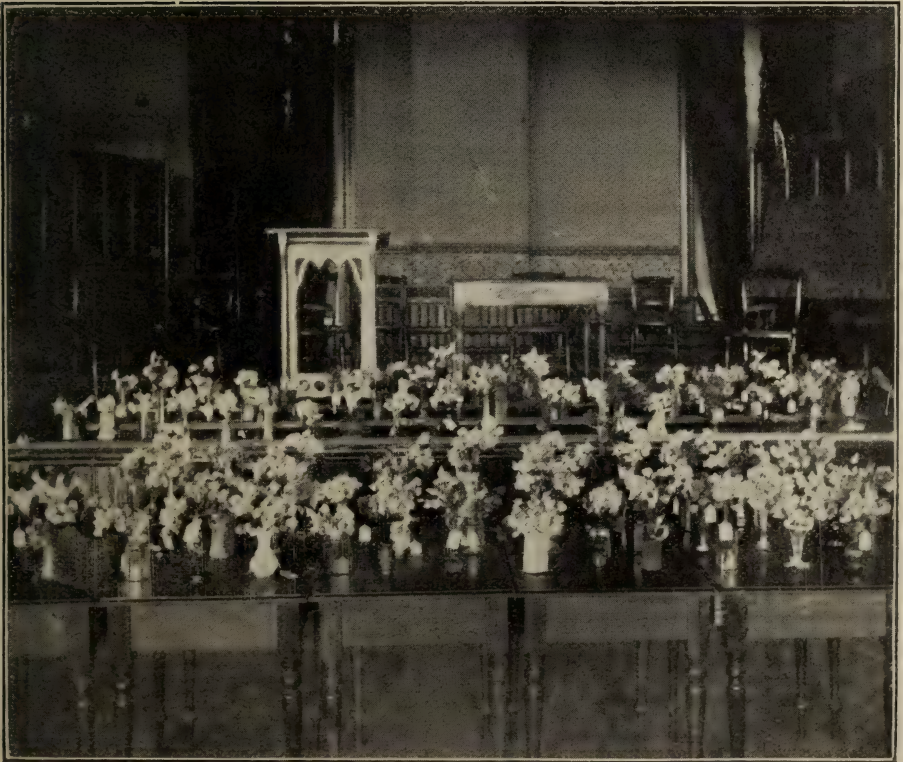
#### SCHOOL CHILDREN'S COMPETITIONS IN OTTAWA.

Mr. SHORT, Ottawa: Mr. R. B. Whyte for the last few seasons has been carrying out a very successful school children's competition in Ottawa. I suggest that he be asked to outline his method of procedure.

Mr. Whyte: There is no doubt about the value of such work as has been discussed in the last hour in the beautifying of the lawns and streets and what you might call the public effect. But I have always thought that the great thing, after all, was to reach the individual person; and it struck me we could not do that better than by beginning with the school children—with the young child. I have always felt that if you could only get a boy or girl really interested in growing flowers you were doing him the greatest benefit you could possibly effect upon him. I do not know anything that does more to keep a boy or girl out of mischief, out of bad habits and bad company than to have a garden of their own, and to take an interest in that. With that object in view, through our horticultural societies four years ago, I began the distribution of seeds to a limited number of school children. In a large city like Ottawa it was financially impossible to give seeds to all the children, and I found always there were many of them that could not grow them; they had not the facilities. For that year I started with Aster seeds, and the mode I followed was to give three packages of Aster seeds—one white, one colored, and one pink (I am speaking from memory)—to ten children in each class of fourteen schools of the city. I left it to the teacher to select those who would get the seed. I delivered to the teacher an order on our seedsman; I delivered ten orders to each teacher to give to the children he thought most likely to carry it out. I gave them, along with the order, three entry tickets, numbered, with instructions that the entry ticket should be attached to the exhibit; and the teachers supplied me with a record of the names of those who got tickets and what they were for. In discussing the matter with friends in the city we came to the conclusion that it was absolutely necessary that we should give instructions what to do with them, so I printed a little bulletin (showing bulletin), and that bulletin I made just as simple as I possibly could. It gave them the necessary instructions



A Prize Garden in a competition held by The Deseronto Horticultural Society.



Sweet Pea Exhibit, grown by School Children for prizes donated by Ottawa Horticultural Society.



how to grow Asters successfully. I found a good many of them failed, even after reading the instructions, but we foresaw that, and we did not expect they would all succeed. My intention was to visit all the children during the summer and see how they were getting on and help them with what advice I could, and I did get over a good many, but I found, in spite of instructions a good many had covered them too deep, and they didn't come up at all, so that when the time came there were just about 40 per cent. of the total number of children able to make their entries; but I was more than pleased with the quality of a lot of flowers shown. In every respect they were equal, and in many cases superior, to those grown by our regular exhibitors. The thing was kept up another year. In the second year it was sweet peas. It was thought that the Asters were rather a difficult thing for young children, inexperienced children, to successfully grow, but we thought everybody could grow sweet peas—they are comparatively easy.

The second year we tried sweet peas, with very gratifying results. Only about the same number showed—40 per cent.—but it made a very pretty show. In discussing the results of that year's work we felt that there were a great many children disappointed because they were not in a position to grow seeds; they had no gardens. The next year a division was made and ten children got poppy seeds, seeds that I grew myself, and also the same number of children got geranium plants. The plants were given out in four-inch pots, most of them in bloom, of the same variety, and prizes were offered for these at the September show. About the same proportion succeeded with the geraniums. The fourth year—this past year—Phlox Drummondii was grown and begonias; we divided the seed into two divisions. The proportion still kept about the same. One of the great difficulties that faces a city organization of this kind in encouraging school work is the fact that the holidays interfere very materially, as such a large proportion of the school children leave the city altogether for six or eight weeks in the summer time. It is very difficult, and I don't think we can expect ever to get more than what we have got, that is, 30 to 40 per cent. to complete the experiment. In smaller towns the proportion should be greater, but the success we have had on the whole has been very, very gratifying to Mayor Ellis and myself, who carried it on at our own expense for the last two years. Those who have showed showed exceedingly fine plants. The flowers have been very good in every case. The flowers have been equal to those shown by the more experienced exhibitors. I may say I have pursued the same policy in every case of issuing a bulletin. I was convinced that it was no use to give seeds without instructions, and verbal instructions were practically of no use, so in every case I have issued bulletins, how to grow them, prepare them for exhibition, and everything of that kind. I might speak of another feature that I have found of very great value, and which I have kept up this year, in addition to the money prizes, which were never very large, because the expense was considerable—in the case of flowers the highest prize was \$1.50, and from that down to 25 cents. On different occasions, including this year, I have given a comparatively large number of Gladioli bulbs, in addition to the money prizes. Each first prize this year got 60, each second 50, each third 40, and so on down. The first year I tried (that was two years ago) I offered prizes for flowers grown from those bulbs the following year, and they were a remarkable success. The value of that is that it keeps up the continuity; you have got that same child for at least two years. Naturally, it is the older children in the school who get these seeds, and they have been put in the higher classes that year and you lose them; but if you give them a bulb prize you hold them for at least two years. This year we are going to give Gladioli



The Fall Exhibition of the Brantford Horticultural Society.



The Guelph City Hall as improved by Window Boxes added by The Horticultural Society.



bulbs again; there was a general consent on the part of the children. I grow these bulbs myself, so that there is no extra expense in giving the bulbs.

#### INTERESTING BRANTFORD'S SCHOOL CHILDREN IN FLORICULTURE.

J. WALTER BROOKS, Brantford: Our society was organized in 1868, but we found under the old plan of carrying out the show for flowers, fruit, and vegetables it was a failure with us, and we got bankrupt, but it has been in existence all that time; we never failed during that time, and I think it always paid before that year.

The PRESIDENT: What year was that?

Mr. BROOKS: The year we failed was in 1903. In 1904 we held no show. We got through the year as well as we could, and saved a little money so that we could start the next spring. The next year we started, and we bought seeds and gave to the children, and we gave plant prizes. We gave no money at all, and we found it has been very successful. This last spring we distributed 8,277 packages of flower seed to 1,500 of the children of the public and separate schools. There were five in each large package; those were delivered to the children, five packages of different seeds. Last year we gave Asters, Scabiosa, Zinnia, Verbena, and Nasturtium. We did not bind them to take seed from us at all. Our exhibition was held on September 14th. We had 493 entries, and gave as prizes 127 plants. These were acaria, palms, rubber plants, and ferns, and 600 hyacinths. The hyacinths were for some extra prizes. We found our program ran out of prizes; there were some that our judge thought should have some extra prizes, and I gave them bulbs then. We gave a bulb to each pupil that made an entry, so that they all got something. I am around the streets of Brantford a great deal, and a great many of the ladies of the city have met me and said: "Oh, Mr. Brooks, haven't you got any more of those nice plants. I didn't know there were such nice plants before. I would like to buy some." I told them I did not have any to sell. I always gave them away. This year we gave away 600, and I expect good results from them. At our show I think there would be about 1,500 present; we have no way of telling, but I think there were about 1,500 that night, children and parents, all very enthusiastic. Our seeds were purchased wholesale, and we put them up ourselves; we bought the best seed we could buy—in fact, they were very good flowers. We put them up at a trifle over  $\frac{1}{2}$  cent a package after the printing was all done. We had instructions on our envelopes telling them how to plant them. This is our prize list and program for last year. (Showing.) In putting our seeds up there was a circular telling you how many seeds there are to the ounce, how many seeds there were in each package, how many packages there were in an ounce, and the kinds. Our work, too, did not stop there, and we succeeded in getting the city and authorities to plant bulbs in the city parks. They are just planting them again this year; that was the first time they ever planted tulips in the parks, but through our exertions they have started to do so. Our city altogether is beautified considerably by those flower seeds that are given away. Anyone walking around the city of Brantford will notice at almost every house that there are some flowers growing where they did not grow before. We also had communication with the City Council respecting a piece of land that we have in the city belonging to Greenwood Cemetery. It is not going to be used for cemetery purposes any more. We asked them to get this fixed up and plant it with shrubs and trees for nature study, and have them labelled with the common and botanical names. That they could not do at present; they would have to get special legislation, but we think if we

try them again they probably will do something. They made some improvements there, but we did not succeed in getting them to carry out the other. Whether we were breaking the Act or not by what we have been doing, I see that we spent nearly half the money that we spent on shrubs, plants, seeds, and bulbs. I do not know whether the Government will bar us out or not according to the Act.

MR. JAMES: Why are you afraid?

MR. DIAMOND: The Act is not retroactive.

MR. BROOKS: Those shrubs were given to members, for a premium on the membership. Plants were given to the children, were for prizes, and the seeds and bulbs were given to the children for prizes, and I find that we have spent over \$100 on that. Our shrubs were \$14.85, our plants were \$31, our seeds were \$42.13, and our bulbs were \$10.35. You see that is the way we spend our money, and as Mr. Cowan figured out what we would be entitled to next year from the Government, I think that the expense of doing this work should go in with the amount of money expended, because it is all spent for that same purpose. Really it is the cost of delivering these things.

MAJOR SNELGROVE: You mean the general managing expenses?

MR. BROOKS: Yes.

MR. DIAMOND: The reports will be made in January, so it will not affect the report in May.

MR. BROOKS: No, I suppose not. I shall be pleased to give any information to those interested in giving seeds to children, even if they write me at any time. (Applause.)

MR. SCHIERHOLTZ: We at Elmira have done some work among the children, but ours is yet the day of small things. We have not any wealthy men, or at least any liberal-minded men, that give \$50 or \$75 a year to our Horticultural Society, and our membership is small, only between fifty and sixty-five, so that the funds at our disposal do not amount to very much. But with what we have we have done a little. Last year—in 1905—we distributed Aster seeds among the children. We bought between \$4 and \$5 worth of seeds of different varieties and mixed them ourselves, and put them into packages, giving a package of seed to each family represented at school. Well, they took quite an interest in it, of course. I don't know that the percentage that exhibited was any larger than Mr. White said; I do not suppose it was. In the fall we held an exhibition, allowing the children to exhibit those flowers raised from these seeds, but from those only, and exhibit them in connection with a general exhibition, where anybody was allowed to compete. To the general exhibitors we gave money prizes, although only small ones, and to the children we gave bulbs. We gave them the privilege of picking out whatever bulbs they wanted, as much as their prizes amounted to. This last spring we added sweet peas to the Asters, and we had an exhibition again, a very creditable exhibition, and the children seemed to take a great interest in it. I would just like to ask those who tried that plan whether they barred any other exhibits that were not raised from those seeds, and what results they had.

MR. DIAMOND: In the Belleville society we barred everything that was exhibited that was not according to the seeds that were distributed; that is, the judges knew exactly the color of the Asters that were to be exhibited, and they knew pretty well nearly whose seeds they were, and the judges I know, in very many instances, threw out Asters which were not of the same description or color. Even among the big society exhibitors you will always find they are true to their instinct, trying to get the biggest; it makes no difference whether they have to borrow it or not; and it was very often found that



some fine Asters were not of the same quality, and our judges have always thrown them out. This year we have made four beds in our school yard, and we have had them planted with tulip bulbs. We intend to carry that out in the different schools, and probably next year we will give prizes for each school. We have given seeds to all school children, from the lowest in the public school to the highest in the high school, and a family may have three or four in the same school, one commencing in the primary and another in the high school; we generally manage to give them each a package. We give to all schools, separate as well as our own. It has been very successful in Belleville, as far as distributing the seeds is concerned. Instead of issuing instructions as Ottawa has done, we have envelopes, and upon them we print the instructions to each child, so that they have the mode and all that right in the package which they get. We have not come up to the high standard that they have in Ottawa, in giving them the whole description of how to attend to them after the plants have grown, but we have found it very instructive to the schools and to the beautifying of our city. I agree thoroughly with the idea that there is no act that the Horticultural Society, or any other society, can do better than to cultivate the taste of children for flowers in the homes, and we have started—as Major Snelgrove started to discuss it—a Civic Association. There is a branch of that started in the city now, and we trust by next year we will have a better report than now as far as that is concerned.

Mr. HAYDEN, of Cobourg: I think it my first duty, as I was one of those who first started the civic improvement idea in the Province, to congratulate you and Mr. Cowan and the officers who have had this good work in hand in the last twelve months. I do not know when I have heard a subject that has delighted me more than Mr. Brook's presentation of the work done in the city of Brantford during the last year or two years. Surely such work as that is not breaking the new Act, as he said in closing his remarks: "I hope by doing good to the school children of the city of Brantford I am not breaking the Act, and that the Department will not be keeping back some of the funds of the Brantford society." All I can say is that every time you do good to the school children or beautify your town or city you are building up a true horticultural society in that city. I have had some experience in Cobourg in introducing the civic improvement idea; I have had some experience in giving seeds myself to the school children of the town of Cobourg in the last four years, and I never spent a dollar that I was repaid so much as by donating these seeds year by year to the children of the town of Cobourg. I could keep you delighted just to tell the experience, the delight it has caused the children of the town of Cobourg growing the Aster and the sweet pea seeds and the great interest they have taken in all lines of horticulture, and their parents as well. It is visible every fifty yards you go in the town. Compare that spirit and the spirit of civic improvement that Mr. Whyte and other speakers have shown to-day with the old regime, with the old idea that horticultural societies were nothing but a place where a man should spend a dollar and get two or three dollars of seed potatoes, and consider that that step has been taken in the last three to five years. This larger idea seems to be taking hold all through this Province. The only thing I regret about this magnificent meeting to-day—not that I am a disciple of Dr. Osler; not that I do not like to see the old gray-heads in this room—but I would like to see at another meeting next year a representation of the young men of this province, and I throw this point out, that when the horticultural societies are electing their two or three or four delegates they should send a representation of the young men of the



A Corner, showing a Rose Bush, in a Prize Garden —at  
Deseronto.



A Prize Garden at Deseronto, Ont., in a competition held by The Deseronto Horticultural Society.



societies. I thought of that this morning, and I think so seriously this afternoon. I can only say that I am delighted with the discussion this afternoon and this morning, and with the act and the whole work of the association. I do not believe there is a town in the Province of Ontario where you cannot get some liberal man if you go to him the right way and ask him to present a package of Asters or sweet peas to every pupil in the town. They only cost a cent to a cent and a half. I am quite sure that when every society represented here to-day comes next year to report, the most pleasant report, perhaps, will be that of the work done among the school children. (Applause.)

Mr. WOODRUFF: We have heard of the success of quite a number of our societies in the distribution of plants and seeds to school children. You will perhaps like to hear something on the other side of the question. Messrs. Scarff and Dawes, of the Woodstock Society, are present.

Mr. SCARFF, Woodstock: Woodstock has been, for many years taking a great interest in this line of work, instructing and teaching the school children to beautify their homes. We have distributed many, many hundreds—and thousands, I might say—of bulbs and plants to our school children, and it has had a wonderfully good effect. I think Woodstock can pride herself on being one of the prettiest little cities in the Dominion of Canada for homes which are beautified by flower beds and shrubbery, and also their public school grounds. I do not know that I can advance anything but what has already been said, more than that I am delighted to be present here to-day and see that this Ontario Horticultural Association is progressing so well in such a short time. I am sure in the next few years, if you keep on in the way you have started, you will be a credit to this country. I quite agree with the gentleman who spoke a moment ago; I would like to see more of our younger people represented in this association. I think the remarks which were thrown out by him were very good, and should be taken advantage of by some of our younger members.

Mr. JACKSON, Port Hope: Trying to develop and inculcate in the child at school the love for flowers has been a pet scheme of mine for years. When I was secretary of the Port Hope society for some years it was a thing I advocated strongly. I am very sorry to find Port Hope not represented here to-day; I fully expected it would have been, and I do not know why it is not. It does seem to me if we can establish something in the minds of our boys and girls of this idea of floriculture it will spring up and bloom and blossom. I really feel very keenly on this subject, and I feel we cannot spend our money better; it cannot be spent to better advantage, break the Act though we may. I believe \$100 spent on our school children to-day will be the best spent money we can spend. I am perfectly satisfied to make some sacrifice; I am satisfied to give my lot to my children any time if I thought it would do them good, and I believe it does them good, and if we can establish in the minds of the boys and girls the idea of growing plants, it has a moral influence. There is no man or woman who studies flowers as they should be studied but is a better man or woman for it. The same thing applies to children. If we once establish in their minds the idea of floriculture I am satisfied they will be better boys and girls than they would be without it.

Mr. McCULLOUGH: I just want to remark that the Hamilton society has had a great deal of experience in distributing both plants and seeds to school children. We differ a little from Mr. Whyte's method; we have always called for volunteers and apportion them as far as possible. Then we have made arrangements with whoever was supplying us the seeds that any child

who has been left out, but really wants to grow plants, can have them for a nominal sum. As far as prices go we have never given money prizes; we have always given plants or bulbs or something of that kind. Another thing we have encouraged is the competition between schools, one school against the others. We have always given prizes for the best school exhibit; each school exhibit competed separately. The first year, for instance, we gave 500 bulbs to the school which had the best exhibit, and when they got the 500 bulbs there was not a bed on the school grounds to put them in, and the Board of Education was forced to make the bed to plant those bulbs, and that bed has had to be kept planted ever since. I just wanted to point out just wherein we differ a little from Ottawa. We probably distributed to the school children four or five years.

Prof. H. L. HUTT, Guelph: I am pleased with the discussion we have had on this subject. I think there is nothing our horticultural societies can take up of more importance than the interesting of the young people in floriculture and horticultural work. I believe it is at the basis of civic improvement work. It is sometimes hard to get the older people to fall in line as we would like them to, but if we can get these young people interested there won't be the difficulty in the future for working up a civic improvement movement. We have had some experience at the Guelph Horticultural Society. It started about four years ago, and distributed, I think, about a thousand geranium plants to the children of the schools, to all the different ward schools throughout the city, and the separate schools. That was held only under the auspices of the Horticultural Society. We had those plants brought to the City Hall and judged there in the afternoon and had a distribution of prizes in the evening. We had a fine display, and the hall was packed in the evening about seven or eight hundred young people, but there were not enough teachers or parents there to keep things in order and it has been described since as a "howling" success. The children were all so interested and so keen to express to each other how they had succeeded during the summer that it was pretty hard for a chairman to hold them in, and there was a murmur all over, and we had to do the best we could to get the prizes distributed. We learned that the best way is to work through the school authorities, and since then we have got the school authorities to help us in the distribution. We buy the seeds, bulbs, plants, or whatever they may be, and take them to the school and have them distributed through the teachers, through the different grades throughout the schools. We tried to get as many grades as possible taking part in it, from the youngest to the oldest. We distributed with the seeds carefully prepared directions, the same as Mr. Whyte has. I think it is well not to leave them to depend on their memory, but to give them a little printed circular, which they can keep for reference, giving full directions for the care of their plants. In September the plants are brought to the Central School—they have a large room there where the plants are brought and judged—and the prizes are awarded in connection with what they call the commencement exercises in the fall of the year, so that they came in as a very pleasant feature, and the flower display is held at the time of those exercises. We give no money prizes, but prizes in the way of something that will encourage them in the future. We have given this year *The Canadian Horticulturist* to a number of those getting the first prize, and along with that some of the finer plants, either palms or ferns, or some nice house plants or bulbs, using bulbs that can be used for forcing work throughout the winter, so that they are encouraged to carry out their floriculture throughout the winter. Instructions are given as to how to care for these bulbs. This



has worked out most successfully. We have tried a number of different plants, but the geranium among the house plants is a good one to work on. Of the seeds we have tried Asters, sweet peas, and some of the different annuals, but the Aster makes an excellent one for that work. I think that every society throughout the Province can well afford to devote some of its funds to this work. I do not think that a society can employ its funds to better use than in encouraging this work among the school children. (Applause.)

Mr. STEPHENS, Orillia: I am diffident in giving my experience in the Horticultural Society after hearing so much from other gentlemen. Seven years ago we thought it well to interest our school children in the matter of nature study, and we therefore put on four or five prizes in connection with the courses for that year. It was very successful. The next year we added another feature for collections of wood showing the grain. Year by year we added something to it, until we had five or six matters of that description, and last year—1905—we thought we would take up the matter of flowers grown from seed. At the annual meeting in January I brought it up before the board, and they agreed with me, and gave me a free hand to do what I thought fit. We were short of funds; we had no surplus, which I think a society such as ours never should have so long as they pay their annual expenses. I went to the school board and told them what I wanted to do, and asked them what they would do for us. They said, "How much do you want?" I said, "I think about \$12 would buy all the seeds we want," and they passed an order giving it to us. I arranged for four hundred packages of seeds through a local dealer, and these were distributed in April, with a circular giving full instructions, and they were distributed, I believe, to such as would ask for them and guarantee to take care of them. I know that during the summer they took a lot of interest in caring for the plants, and in September, when we had the fall show, the Horticultural Society taking the horticultural department in connection with the Agricultural Society—I am afraid we can't do that any more—and I think 360 exhibits were made of these different flowers. There were four varieties of seeds; we had three large school buildings and two sections for each school, junior and senior, but the senior grade of the Central School was left out altogether, as we thought the boys and girls a little too old. We had a most magnificent building, but unfortunately our exhibition building was taken down and we could not spare the room. Next year we hope to take it up as before. It has had a very beneficial effect on the boys and girls, boys especially. It used to be that people growing flowers and fruit were not sure but that any night there would be vandals breaking through and stealing. There has been nothing of that kind for the last two or three years. The boys understand what it is to own flowers of their own, and they have a fellow-feeling for others and respect their rights.

Mr. WOODROOFE: I was very much pleased with the remarks made by Prof. Hutt. I fully agree with him that unless we enlist the sympathies of the parents and teachers that we can hope for very little success. Some of you possibly noticed a slight discrepancy between what I said in asking you to call upon Mr. Scarff to speak and what was actually said. The fact of the matter is, I am perfectly in accord with what Mr. Scarff said as to the success of our society in distributing the plants and seeds, etc., but I am a little doubtful as to the great benefit derived from it. Of course, we have no proof of the success of these plants, bulbs, and seeds. The fact of the matter is, a number of these distributions were made with the express stipulation that the school children should exhibit them at our annual exhibition. To give you an idea of the success of that part of it I may say that I think

it was the year before last something like three thousand Gladioli bulbs were distributed among our children, and there were not twenty spikes of Gladioli exhibited at our show. I think the results in Asters and geraniums were somewhat similar. It is not the fact that the children do not take these, but they do not seem to take the trouble to bring them and show us the success of our distribution. Whether the fact is attributable to our not giving money prizes is a question. There is no doubt of it that the early associations of children very much affect their tastes, and I was very much struck with this when I was listening to Mr. Murphy, from Simcoe. Now, the young people in Simcoe have had an object lesson before them for the last thirty years. The public schools of that town have had grounds surrounding them kept quite as nicely as any private grounds, and, in fact, fit, I think, for any competition; therefore it would go somewhat to show that whether the children will show interest in the distribution of plants and flowers, may be attributed somewhat to the surroundings in which they find themselves.

Mr. WHYTE: I would like to emphasize what Prof. Hutt says on the absolute necessity of enlisting the sympathy of the teachers and the school authorities. If you do not do that the thing will be a failure. I must confess I have not done it to my own satisfaction at all, but I find it is absolutely necessary. Every year I get the permission of the Inspector to address the staffs of the schools and I asked them to see that the children do not forget to enter and neglect the work.

The PRESIDENT: We have this afternoon the presence of the Deputy Minister of Agriculture, Mr. James. We are highly honored in having him with us, as this is the fourth series of meetings that have been held in the city during the week in connection with the Ontario Horticultural Exhibition. The Fruit Growers, the Bee Keepers, and the Vegetable Growers have met here, and now the Horticultural Societies have sent their representatives here this afternoon. In all of the other three cases there has been a commercial aspect in connection with their meetings that is absent in this. We are not here, any of us, for any pecuniary advantage that we can secure by the progress and development of this work in which we are engaged. I think, therefore, it is very highly pleasing to see so many people gathered here, very largely, I suppose, perhaps, altogether, at their own expense, to discuss matters for the bettering and advancing the work of the horticultural societies of the Province. The discussions during the day have been very valuable, and I think that they will be made more prominently so by the generosity of the Department of Agriculture in providing for the taking down and the printing and distributing of reports of this meeting. No doubt the meeting before it closes will take some formal action in the way of extending thanks to the department for their liberality in this respect, and for the promise we have for the future, of which we have not been able to avail ourselves to-day, for the appropriation for the making of our meetings more interesting and profitable. However, I take it upon myself when asking Mr. James to speak, to express to him the feeling of gratitude that we have to the Department for all the work they have done and the interest they have shown in the work of the horticultural societies of the Province. (Hear, hear.) When it has been our duty as representatives of this association to call upon the Hon. Mr. Monteith or Mr. James we have found willing ears to consider the requests we have made, and, as you know, in most cases they have been granted.

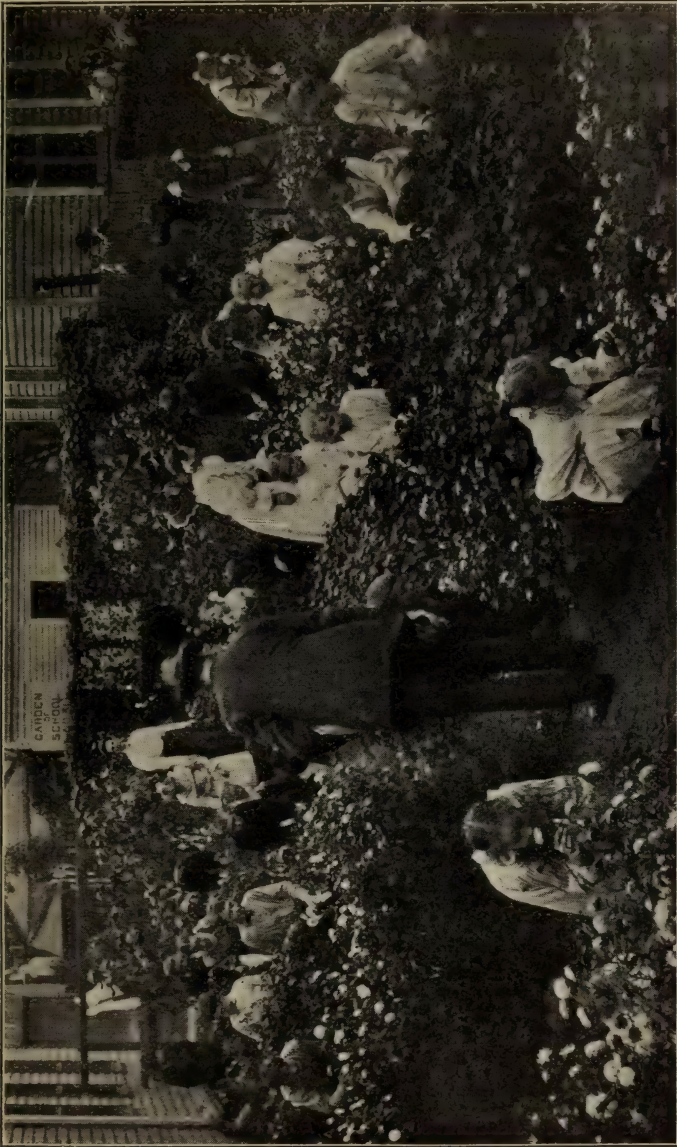
Mr. C. C. JAMES, Deputy Minister of Agriculture: When your president invited me to come down and attend your meeting this afternoon he did not couple with that any promise or threat that he was expecting anything in



the way of a speech or address. I supposed at the time that he simply wished me to come down and see what a progressive, fine looking lot of men you were, and so, not knowing that I would be able to get away from the office to come down, I prepared nothing. There was just one remark that your president made that, it seems to me, might be enlarged upon or some exception might be taken to it. He said there was no commercial aspect in connection with your association. The luxuries of one generation become the necessities of the next, and we are very rapidly finding that flowers and beautiful surroundings, which a few years ago perhaps might have been considered luxuries, are now being considered as necessities, and the great floral industry of the country is very rapidly being placed upon a purely commercial basis, and it will not be very long before we have to take into consideration the value of our annual production of plants and flowers, which a short time ago we considered simply and solely ornamental. Apart from that, even those who are not interested in the direct production under glass or in the open air of flowers for sale, there is a very important commercial aspect to this work, which you yourselves well know in your own towns. The beautifying of your own home certainly adds to the commercial value of the property. We have been watching, so to speak, at a distance the work of the horticultural societies of this Province. I think you will admit that we have not interfered with your work in any way; we did not think there was any necessity of interfering with your work, and you have at last, of your own accord, got this association together and seem to be conducting it in an able manner. It is just possible we may step in and take part in your work, not that we wish to get any glory out of it after you have done the work, but as you will have noticed, the agricultural and horticultural work is becoming more and more specialized. A few years ago we simply had large organizations covering the whole field, but the development of specialties has been followed by the organization of special associations, and I think we have at last got the field that is our particular province to look after pretty thoroughly organized. I do not know just what we need to have organized next. This week we have no less than four of these organizations meeting in Toronto, and it is just barely possible you may find it necessary in time to split up into two further organizations dividing the amateur from the professional. The development of work along these lines has necessitated the organizing of associations to look after the particular interests that are concerned, and so you have found it necessary or advisable to form this organization. We have been watching it. It seems to be doing very good work, indeed, and this year, when you asked the Minister for some special consideration, there was no hesitation on his part when the memorandum was properly laid before him in acceding to that request. It is not much, but perhaps you were shrewder than some other people in not asking more. Whether you get more will depend not on what you ask for, but on what you do. I can say this on behalf of the Minister, that if you should need more for legitimate work you will get it, but you will have to prove the value of your organization and the work you are undertaking. The discussion this afternoon is one that is intensely interesting.

For a great many years we have been talking in the Agricultural Department of the necessity of getting hold of the young people. As you are aware, our Farmers' Institute work, for instance, has been engrossed entirely with the education of the men and women; and, as I have pointed, that is a case of working from the wrong end entirely. We simply take a man full grown, or a woman full grown, and say, "Here is your organization—your Farmers' Institute or Woman's Institute," and we have been neglect-

ing in this country almost entirely—and I think it is to our discredit—we have been neglecting the younger people. We have waited until they get to middle age before we provide them with facilities to become particularly instructed along the lines of their life work. In this work on horticulture and floriculture, especially among the boys and girls of our public schools,



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you are beginning not at the wrong end, but at the right end. It is a work to be encouraged. I would not be sorry to see every dollar granted to your association spent in that way. It is work that would probably in the near future be productive of more than money spent in any other direction. I do not know why two or three seemed to venture to suggest that perhaps they



might not be spending the money in the right way by spending it in that direction? Was there any particular reason?

The PRESIDENT: In discussing the Act this morning there is one clause of it that says that not more than one-third of the total receipts shall be expended upon any one of the seven objects of the horticultural societies, and the fear was that if the expenditure of one-third was exceeded the grant would be forfeited, and they would be penalized for spending so much in one direction.

Mr. JAMES: You had a pretty long discussion, I understand, in connection with the Act. That Act, as well as other similar Acts, was the outcome of long consideration and work on the part of your secretary and a good many deliberations on the part of Mr. Cowan, the Minister of Agriculture, myself, and some others; but you will please understand this, that law is not inexorable. It is not the law of the Medes and Persians; we do not put it out as perfect. It would be strange if we do not find it necessary to modify it, to change it, or to interpret it liberally. There is where the Department has the opportunity, and I think you will find in the interpretation and enforcement of that Act you will be met with fair liberality on the part of the Minister and the Department. The only object, of course, that the Department should have would be the encouragement of horticulture along the best and most feasible lines, and if that Act will not help us, let us know what we should have, and we will try and make it better. (Applause.)

The PRESIDENT: I am sure we have been very gratified at what we have heard from Mr. James, and especially his assurances in his last remarks that the Department would be generous in the interpretation and enforcement of this Act, and that their object, like our own, is to secure the best work in the best way. What perhaps is most feasible in one locality may be somewhat less so in another, but the Department, I am sure, will be quite generous and considerate in the interpretation of the Act.

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### POSSIBLE LINES OF WORK.

Just before the convention closed a brief discussion took place in regard to lines of work that might be followed by the association. Mr. Dickson, of Hamilton, thought the association should publish, in its annual report, lists of varieties of flowers and shrubs, with notes thereon, that had been grown by members of horticultural societies.

The opinion was expressed by Mr. R. B. Whyte, of Ottawa, that a two-day meeting should be held each year, so that there would be more time for discussion of the papers read and reports submitted.

Major H. J. Snelgrove suggested that the Superintendent of Farmers' Institutes should endeavor to secure capable speakers for meetings of horticultural societies.

A motion, moved by Mr. Diamond and seconded by Rev. A. H. Scott, expressing appreciation of the improvements made in *The Canadian Horticulturist*, and of the work it has done for the advancement of horticulture in Ontario, was adopted.

The officers of the association were requested to endeavor to secure capable speakers for the meetings of such societies as might apply for them.

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